Aeronautics

SOUTHERN Flight

Including MODERN AIRPORTS

November, 1944 25 Cents

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J. S. FAIRCHI

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WITH PRATT & WHITNEY POWER

Four great types of transport aircraft* carry the bulk of the load flown by the Air Transport Command over its 160,000 miles of global air routes. Flying millions of miles each month, the ATC is continually proving the dependability of Pratt & Whitney engines.

*C-46 Curtiss Commando, C-47 Douglas Skytrain, C-54 Douglas Skymaster and C-87 Consolidated Liberator Express — all are powered by dependable Pratt & Whitney engines.

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ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION

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The South Greets its own new Plant for America's Top-Quality Tire

. . . built to speed the production of military tires now—and to meet the expanding needs of the South and Southwest in the tremendous future ahead.

November 13th marks the dedication of the new plant of The General Tire & Rubber Company at Waco, Texas . . . and of the manufacture of the first tire ever to be built in Texas.

This huge new General Tire plant is strategically located to draw on the vast mineral resources available in adjacent areas.

It is situated also for most efficient coordination with the General Tire synthetic rubber plant at Baytown, Texas, in operation since June, 1943.

Thus, America's immediate need for greatly increased production of military tires will be met by tires built from raw materials drawn from this section — and by willing hands who have contributed much already to solving the tire crisis.

And, when the South and Southwest enter their tremendous peacetime future . . . this General Tire plant will be ready with aircraft tires, passenger car tires and truck tires, built to General's famous Top-Quality standards and built *exclusively* to give you your own source for the maximum in tire performance.

100% war production at Waco now will hasten that day.

THE GENERAL TIRE & RUBBER CO.

AKRON, OHIO • WABASH, INDIANA • HUNTINGTON, W. VIRGINIA • BAYTOWN, TEXAS

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Aerodynamic Braking by
REVERSE THRUST

Aerodynamic braking, another first by Curtiss, brings to the science of flight a new and significant development. The propeller, long the source of forward thrust in aircraft, now provides thrust in reverse to reduce the landing roll of the airplane smoothly and surely, regardless of ground friction. Aerodynamic braking, like many other features, is inherent in the versatile Curtiss design.

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3. Smoother deceleration
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5. Shorter taxi time
6. Unassisted ground handling
7. Reduced tire and brake wear
8. Lighter brake system possible

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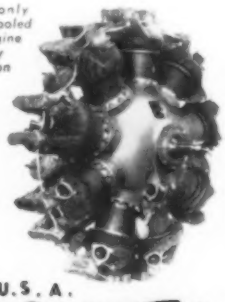

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Eleventh Year of Progress with Aviation

NOVEMBER, 1944 VOL. XXII, NO. 5

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JUST AMONG OURSELVES

Editorials and Comment

YEAR'S END

THE fact that the United States faces a dangerous legislative and policy crisis during the present transitional stage of aviation development is admitted by clear-thinking people in every field of aeronautical endeavor. The social, military and economic implications of the airplane in the postwar world are now clear and inescapable, transcending the outcome of November elections, the selfish interests of special groups or the ambitions of individual nations, including our own, for mastery of the skies in the days of peace to come. The eleventh hour has struck for the solution of aviation's total problems, for the modernization of our thinking and the rapid translation of that thinking into realistic and streamlined national and international air policy.

Is it too optimistic to hope that the last sixty days of 1944 might become the most significant period in recent aviation history? We don't think so. The International Aviation Conference opens in Chicago November 1; the second annual National Aviation Clinic in Oklahoma City takes place November 15-18; and the National Aviation Trades Association convention is scheduled for December 5-9 in St. Louis. Domestic and international airline operators, manufacturers, suppliers, service institutions, every aviation organization and association, government officials and agencies, non-scheduled civil aviation interests and our military services will be adequately represented in these three year-end conferences. Because of their all-inclusive nature, these forums are potentially capable of drafting a realistic and workable pattern for future aviation development and expansion.

While the International Conference gets down to the serious and complex problems of postwar global air operations, airmen primarily concerned with the muddy waters of domestic aviation might well devote most of their thought, energy and discussions to the basic problem of new federal aviation legislation which must be enacted by Congress early in 1945 if all phases of aviation are to expand commensurate with public demand, convenience and necessity, and if, as a nation, we are to preserve an adequate measure of our air strength amassed at tremendous expense under the impact of total war.

We have seen enough of the results that derive from a hundred and one agencies dabbling in aeronautical affairs. We have suffered enough from niggardly peacetime appropriations for technical research, for civil aviation administration and for all the other legitimate functions and responsibilities of the federal government. In short, we have operated too long under 20-mile an hour jurisdictional control of 250-mile an hour transportation.

Little would be gained by appointing additional special boards or commissions to pursue new studies and turn out more recommendations. This procedure has been overworked since 1925. The days of special studies, surveys, experiments and statistical predictions should be over. The time has come for action.

Our aviation leadership assembled for the year-end conferences should consider drafting an all-industry supported bill. One approach would be to lift the best features from all aviation legislation proposed in 1944 and combine these basic, generally accepted principles into a brand new bill for early introduction in the next session of Congress. There are many splendid features in practically all the proposed pieces of aviation legislation including the Lea Bill, which caused such a furor earlier in the year. There is an astounding measure of agreement on basic priciples among all segments of U. S. aviation; the trouble is, no one has attempted with vigor or strong leadership the fusion of all aviation interests for the purpose of originating new federal aviation legislation. We are confident an all-industry supported bill, re-establishing the independence of the federal civil aviation agency and creating the necessary machinery for aeronautical expansion, can be achieved *if official spokesmen from every branch of aviation are sitting at the table when the bill is written.*

Not only is the time opportune for launching the project during the next eight weeks around the conference tables, but the stage is set in Congress for enthusiastic reception of an industry-sponsored bill. Aviation has many friends in Congress, but a large number of congressmen are tired of controversial bills upon which no two aviation groups can agree. Until the industry gets together on common ground and threshes out its common problems by means of unity and agreement on fundamentals, blame for the present crippling stalemate cannot be hurled at Congress' feet.

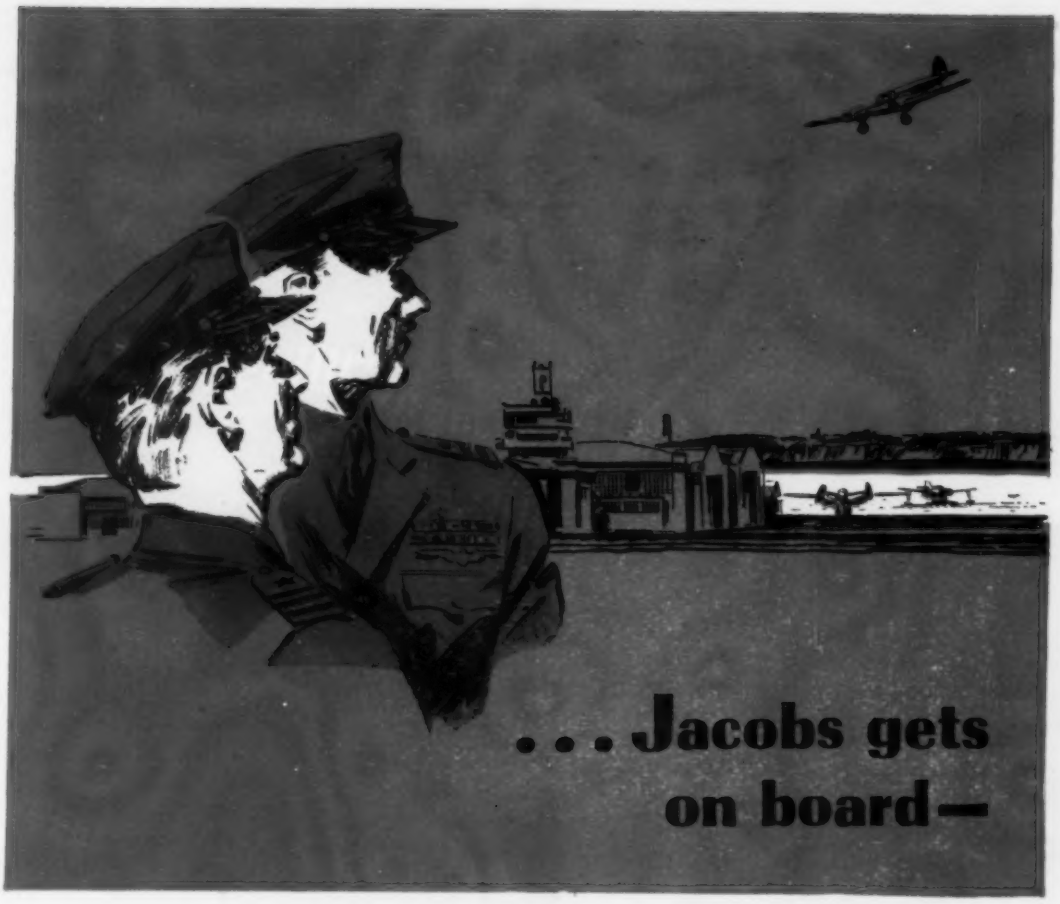
So it's our responsibility as airmen to put an end to internecine strife, to become aware of and appreciate the peculiar problems of every branch of the aviation family, to get together around the conference table for the overall good of aviation. We certainly realize by now we can convene, confer and grind out high-sounding resolutions every week in the year and never get anywhere. The final conferences of 1944 can either go down the easy road of mediocrity and quickly be forgotten as have most of the conferences before them. Or they can take the high road of destiny and through unified action place the people's mandate on aviation, now long overdue, before official Washington, with the memo attached:

"Here are principles upon which we can build one of the greatest peacetime industries in the history of civilization, paralleling the great industry we built for war; an industry whose services will create new, untouched sources of wealth, new horizons of gainful employment; whose prosperity will contribute to the prosperity of all industries and of all mankind; whose power will keep the blood-stained, hard-earned peace for generations to come."

Women Airforce Service Pilots

GENERAL ARNOLD has announced the inactivation of the Women Airforce Service Pilots will take place in December. The end of the WASP program will bring to a close one of the most controversial subjects growing out of military aviation in this war. Arnold's announcement is the official answer to Miss Jacqueline Cochran's ridiculous demand last August which said in effect to com-

(Continued on page 44)



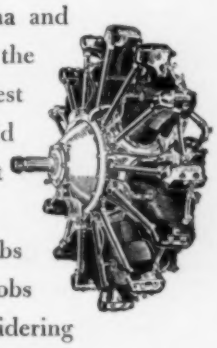
Jacobs has joined the Navy . . . twin-engine JRC's powered by Jacobs have been put into service by the U. S. Navy as light transports and utility ships. The Jacobs engines have been getting their indoctrination — and vice versa!

Brought up on the best, always snooty in its specifications, and convinced by experience that anything on, near or over salt water wears out faster, Navy conservatism looked leniently at "these Army jobs" . . . But we fully expect Jacobs conservatism to raise the Navy's sights.

THREE years ago, when bomber training got under way, the AAF rated the Jacobs used on twin-engine trainers as good for 350 hours between major overhauls . . . gradually extended the period up to as high as 1050 flight hours!

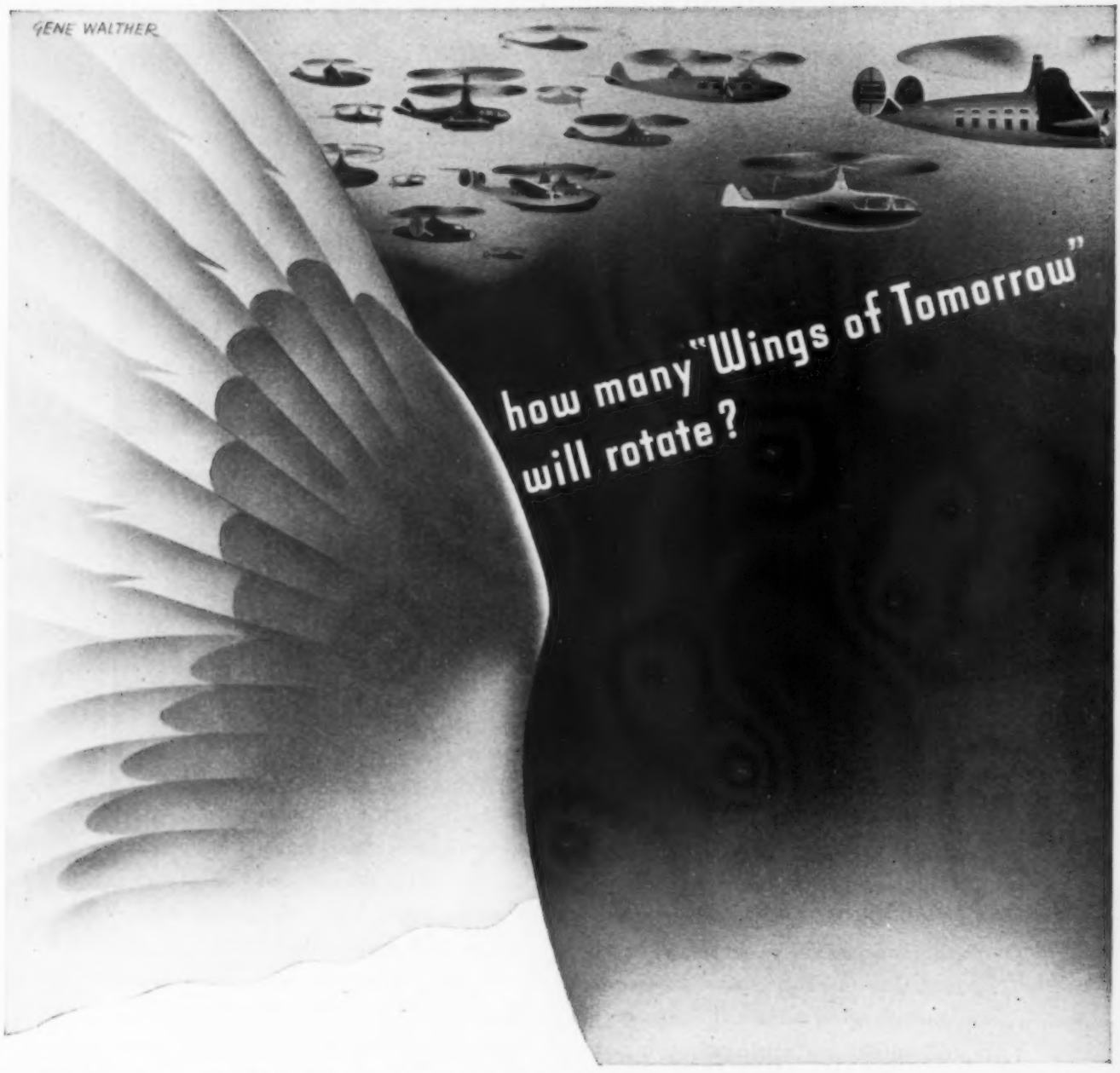
And we doubt that salt water and any Navy operation gives plane engines a worse beating than the Jacobs has taken under hard student handling, practice take-offs and landings, all kinds of field surfaces in all kinds of climates.

As the Jacobs adds days and knots to its Navy service . . . and hard-shell machinists mates find out about Jacobs stamina and performance . . . we are confident that the Jacobs engine will live up to the highest Navy specifications and traditions, add another creditable chapter to its past service records.



The more use and users the Jacobs gets, the more it will get! And Jacobs will have postwar engines worth considering as a *profit factor* in peacetime operations! . . . Inquiries invited . . . Jacobs Aircraft Engine Company, Pottstown, Pennsylvania.

JACOBS • **Pottstown, Pa.**



The American public, the aviation industry in general and a number of aircraft manufacturers in particular would like a specific answer to this question . . . and we wish that we could give it. This much can be said, however, with but little likelihood of disagreement. At no time in the twenty-odd years since the world witnessed the first practical flight of a rotary wing ship, has professional and public interest in rotary wing flight been as active as at present, *nor has the future of the field been as promising* ★ The Autogiro Company of America has been engaged in rotary wing research and development longer than any other organization in America. Its engineering and research staff; its records of development, experimentation and thousands of hours of flight, and the right to use its numerous inventions, offer incalculable assistance to licensees. We shall be pleased to discuss details of Autogiro Company licensing arrangements with interested aircraft or other manufacturing executives ★ AUTOGIRO COMPANY OF AMERICA, Willow Grove, Pennsylvania.

Companies now producing for the war, under license from the Autogiro Company of America, include:

THE FIRESTONE TIRE & RUBBER COMPANY (G. & A. AIRCRAFT, INC.)
KELLETT AIRCRAFT CORPORATION
UNITED AIRCRAFT CORPORATION (SIKORSKY DIVISION)

AUTOGIRO COMPANY OF AMERICA ★

THAT OUR COUNTRY MIGHT *Out-Design* THE ENEMY

Here, behind RESTRICTED AREA signs, Curtiss-Wright is constantly developing new designs and modifying current models. This is the major precept of the builders of military aircraft . . . . perpetual, unrelenting progress!

While this endless research and experimentation centers on increasing the military performance of Curtiss planes, it has a constructive side too. Many of these war-born advancements will have a peacetime application, when an airminded world takes to the skies!

Look To The Sky, America!

Curtiss-Wright Corporation, Airplane Division, Buffalo, N. Y.

Another Contribution of

Curtiss-Wright

Toward Winning This War

Member Aircraft War Production Council East Coast, Inc.

U. S. Navy's Grumman Hellcats Poised for Action

Grumman

AIRCRAFT ENGINEERING CORPORATION, Bethpage, L. I., N. Y.

Light Landings for TREMENDOUS TONNAGE

Hurtling 11,500 miles in 84 hours, Pan American World Airways' "Cannonball" express rushes "hot" priority cargo to the orient. The thundering planes swoop down by the Amazon, span the Atlantic to the Gold Coast, land again by the Nile, dip onto Arabian sands, and complete their flight in India.

At each hurried stop, Aerols* soak up landing shock, help the plane come in safely, and protect vital cargo. Thus, Aerols contribute substantially to the success of the fastest express service in history.

THE CLEVELAND PNEUMATIC TOOL CO.

"PIONEERS FOR 50 YEARS"

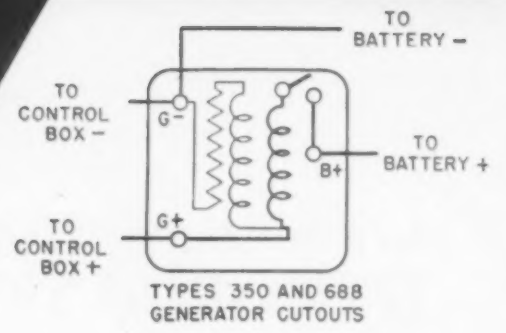
AIRCRAFT DIVISION • • CLEVELAND 5, OHIO

Also manufacturers of Cleco pneumatic tools, Cle-Air shock absorbers for vehicles, and Cleveland rock drills for mining and construction.

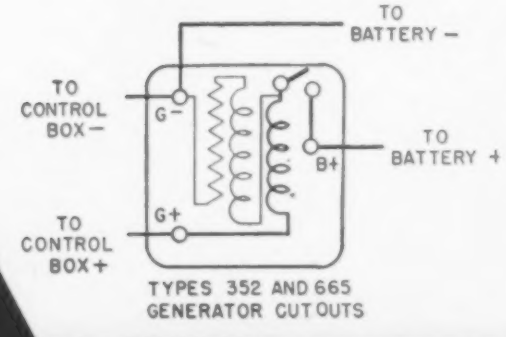
Speed Victory! Buy MORE War Bonds and Stamps

Eclipse REVERSE CURRENT CUTOUTS

Automatically prevent reverse flow of current ★



TYPES 350 AND 688
GENERATOR CUTOUTS



TYPES 352 AND 665
GENERATOR CUTOUTS

THIS MONTH BUY AT LEAST
AN EXTRA $100 WAR BOND

ECLIPSE

Eclipse

Eclipse-Pioneer Division
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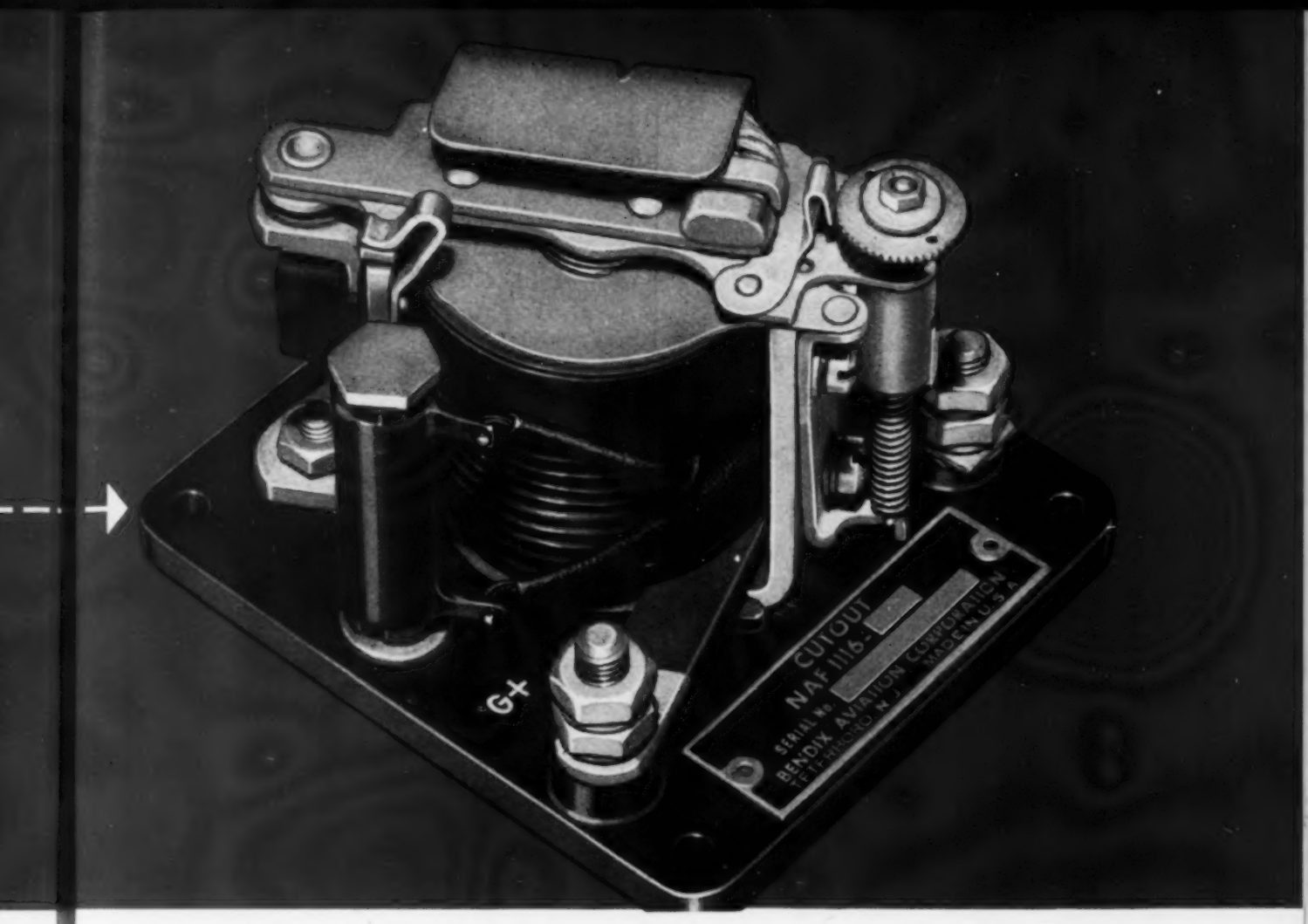


DESIGN CHECK CHART FOR ECLIPSE REVERSE CURRENT CUTOUTS

APPLICATION:

Eclipse Reverse Current Cutouts are designed to prevent the reverse flow of current to generators in aircraft power systems utilizing batteries and generators as a power source.

Properly installed in the Aircraft Power Supply System, they provide a compact, lightweight means of automatically disconnecting generators from electrical systems when generator voltage drops below system voltage.

PERFORMANCE:

Eclipse Reverse Current Cutouts automatically open on reverse flow of current* from battery to generator when generator output voltage drops below system voltage. They also operate as generator automatic main switches.

Eclipse Type	Current-Amperes	Volts D.C.	Setting Volts	*Opening Reverse Current-Amperes	Weight Lbs.	Dimensions—Inches Width	Length	Height
350	25	15	13.5+.1	3	.82	2 1⅜₆	2 1⅜₆	2¼
352	100	15	13.5+.1	5	1.63	3¼	3¾	2⅜
688	25	30	26.7+.1	3	.82	2 1⅜₆	2 1⅜₆	2¼
665	100	30	26.7+.1	5	1.63	3¼	3¾	2⅜

DESIGN FEATURES:

Changes in Cutout temperature have minimum effect on operation.

Operate satisfactorily in any mounting position when adjusted in that position.

Armature leads on Types 352 and 665 are shielded to prevent change in Cutout setting through handling.

Silver alloy contacts have long life and low voltage drop.

Adjustment knob is conveniently accessible and automatically locked.

Lightweight and compact.

AVIATION ACCESSORIES

Bendix

AVIATION CORPORATION

WHEN YOU'RE

Looking for Service

All Kinds of Repairs
FINANCED
Terms 3 to 12 Months
Major Engine Overhaul — Aircraft Overhaul
Engines — Radios — Instruments

Pardner, when you land'er at this corral, you get service—from tear-down, rebuilding and refinishing of aircraft and complete engine overhaul in our government approved shops . . installation of accessories . . complete overhaul and adjustment of instruments and radio—each service is handled by specialists. With twenty years in aviation, we KNOW HOW to get the job done RIGHT the first time! Complete stocks of Radios . . . Instruments . . . Accessories and Pilot Equipment.

With the coming of peace, as in the past—we will be handling the sales of the airplanes that WILL BRING A NEW MEANING TO FLYING.

Latest and most complete equipment to simplify complicated and delicate adjustments of all types of instruments. Factory sales and service representatives for leading aircraft products.

LYCOMING · Continental Motors · Pratt & Whitney · MIMAX-LAVAX · CHAMPION · Stinson · BENDIX SCINTILLA · ZYGLO MAGNA-FLUX · Paraflex · AIRWING · AMERICAN BOSCH · Bendix

AIRCRAFT SALES CO.

MEACHAM FIELD FORT WORTH, TEXAS

AIR REPORT

☆ SIGNIFICANT TRENDS IN THE NEWS

Red Shoulder Loops No More

Civil Air Patrol national headquarters will announce very soon that the red shoulder straps are to be removed from the official CAP uniform. Another important innovation will be a new shoulder patch. This patch will be identical with the old one but with the words "CIVIL AIR PATROL" spelled out above. Members are warned not to take off the red shoulder straps until the new patches are available. Otherwise they can be picked up by military police. Although the innovation might not result in the enlistment of thousands of civilian airmen who originally refused to join CAP because of antipathy for the red loops, many observers believe the move will go far to bring CAP one step nearer some type of postwar military reserve status and simultaneously remove a serious bone of contention among thousands of active Civil Air Patrol members.

★ ★ ★

Airmarking To Be Intensified

Look for renewed interest in airmarking now that the fear of enemy air action over our borders has passed. The CAA airmarking section headed by Blanche Noyes hopes to get the green light from the Army high command soon, especially for the interior states. Civil Air Patrol units are begging for the opportunity to assist in the job. One state government has already agreed to furnish the paint if the CAP will apply it.

★ ★ ★

Landing Fees for Military Transport

Several municipally owned and operated airports are assessing Military Air Transport schedules the landing fees customarily charged the scheduled air lines. And the Air Forces are paying them. The municipalities involved claim that there's no basic difference between MAT schedules and airline schedules, except that Uncle Sam might be in a better position to afford payment. The same facilities and services provided by the city to the airlines are used by the Army Air Forces' scheduled operations.

★ ★ ★

Bigger Engines Under Development

Aircraft engines of 4,000 hp. and more may become a reality sooner than is believed. In December at Wood-Ridge, N. J., Wright Aeronautical Corporation will complete construction of sixteen new test cells structurally capable of accommodating engines up to 4,000 hp. The first such cell is already operating, being used for B-29 engines of 2,200 hp. Wright last month revealed it is working on gas turbine engines for aircraft which ultimately will produce 10,000 hp.

★ ★ ★

Postwar Vignettes

CAA conformity checks have been run and approved on the new 185-horsepower Johnson "Rocket," now being assembled at Ft. Worth for ATC test flights scheduled for November. The "Rocket" is a low-wing, side-by-side, three-place airplane equipped with tricycle landing gear and constant speed propeller. L. D. "Pup" Thomas, president of the Rocket Aircraft Sales Company, national distributor, has announced removal of offices from Lubbock to the Johnson factory on Meacham Field, Fort Worth.

Dead-Eye Dick
on a saddle in the sky . . .

He's a throwback to the Wild West of tradition . . . a two-gun man like his great grand dad, hawk-eyed, quick on the trigger . . . riding herd over half the globe in a bomber, enforcing law and order with a brace of .50 calibers that kill up to eight hundred yards . . . sighting and firing in the split-seconds a hostile fighter flicks within his range . . . And his saddle is an armored, steel-and-plastics turret that turns at a finger touch towards any target in any direction . . .

Some of these hydraulically operated turrets are now powered by the EE 709 . . . a small electric motor of our own design which we are privileged to make for this particular function. Weighing only 16.5 lbs., the EE 709 is built for short period peak loads; delivers 2.5 hp intermittently at 2150 rpm, or on continuous duty, 1.2 hp at 2500 rpm. Special precision-made spiral bevel gears of nitralloy, nitrided to extreme hardness, housed in a grease-filled gear box, permit right-angle pump mounting, and save space. Compound winding of glass tape insulated coils provides high starting torque and improved speed control. An integral fan on the armature shaft forestalls any possible cooling failure. The brush mechanism has beryllium copper springs. Both motor and gear box have full ball-bearing construction.

PRECISION assembled by hand, the EE 709 is one of the most reliable and efficient units of special purpose concentrated motive power ever made . . . And only one of a large line of small light motors and other auxiliary and accessory items for aircraft—designed, engineered, manufactured by Air Associates . . . Inquiries are invited.

• New orders on motors are now assured early delivery.

AIR ASSOCIATES, INC.

TETERBORO, N. J. . . . *BRANCHES:* CHICAGO, DALLAS, LOS ANGELES . . . ENGINEERS & MANUFACTURERS OF AIRCRAFT SPECIALTIES . . . SUPPLIERS OF ALL TYPES OF MATERIALS TO THE INDUSTRY SINCE 1927

IRVIN Air Chute

"SINGLE-RELEASE" Harness

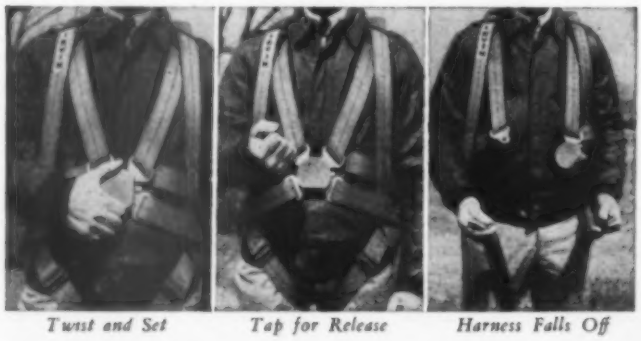
UNITED NATIONS' FLYERS

are using it for

SAFER LANDINGS

A one-hand turn and a tap on the single frontal disk instantly releases the harness . . . leaving the flyer entirely free. Accidental release is impossible before disk is "set" for action.

All United Nations' Air Forces for years have used IRVIN as standard equipment . . . and now the Irvin "Single-Release" harness is acknowledged as superior for all landings. IRVIN, as always, leads in Safety.



Twist and Set *Tap for Release* *Harness Falls Off*

IRVING AIR CHUTE CO., Inc.

Main Office: 1670 Jefferson Ave., Buffalo 8, N. Y.

Factories at other points in the United States, Canada and England . . . All Serving the United Nations' Air Forces.

BUY MORE WAR BONDS

Thomas plans to visit every major airport in the United States as soon as Approved Type Certificate has been granted the Rocket.

ATC flight tests have begun on the Globe "Swift," also manufactured in Fort Worth. The "Swift" is a two-place, side-by-side airplane powered with a 75-horsepower engine. Globe's prototype airplane received the approved type certificate just prior to the outbreak of war. The new model incorporates many changes, improvements and refinements over its predecessor, hence the necessity for additional ATC testing.

★ ★ ★

Small Amphibian for Postwar

At least one large manufacturer now engaged in combat aircraft production plans to build an all-metal, moderately priced amphibian for the personal plane market. The single engine will provide a cruising speed of around 115 mph. Estimated sale price: $3,500.

★ ★ ★

Acceleration for Texas Industrialization

Aviation is figuring prominently in the growing industrialization of Texas. The General Tire and Rubber Co. has taken a significant step by spark-plugging an air tour of Texas industries by twenty-five of the nation's topnotch writers. In November they were to visit General's huge new tire plant at Waco, Army and Navy training establishments at San Antonio and Corpus Christi, Dow Chemical's magnesium plant at Freeport, General Tire's synthetic rubber operation and Humble Oil's toluene processing plant at Baytown, paper mills, lumber industries and oil fields in East Texas, and other points, including Dallas, where U. S. Steel, American Airlines, and the Ford Motor Company planned entertainment.

Beverly Howard, Pres. M. Berley Kittrell, Mgr.

Hawthorne

AERO SUPPLY

Orangeburg, South Carolina

★ ★ ★

Takes Pleasure in Announcing a Complete Aeronautical Supply Service for Operators and Private Owners

★ ★ ★

IMMEDIATE SHIPMENT ON PARTS AND SUPPLIES
JOBBERS FOR LEADING AVIATION MANUFACTURERS

Retail Stores Located at:
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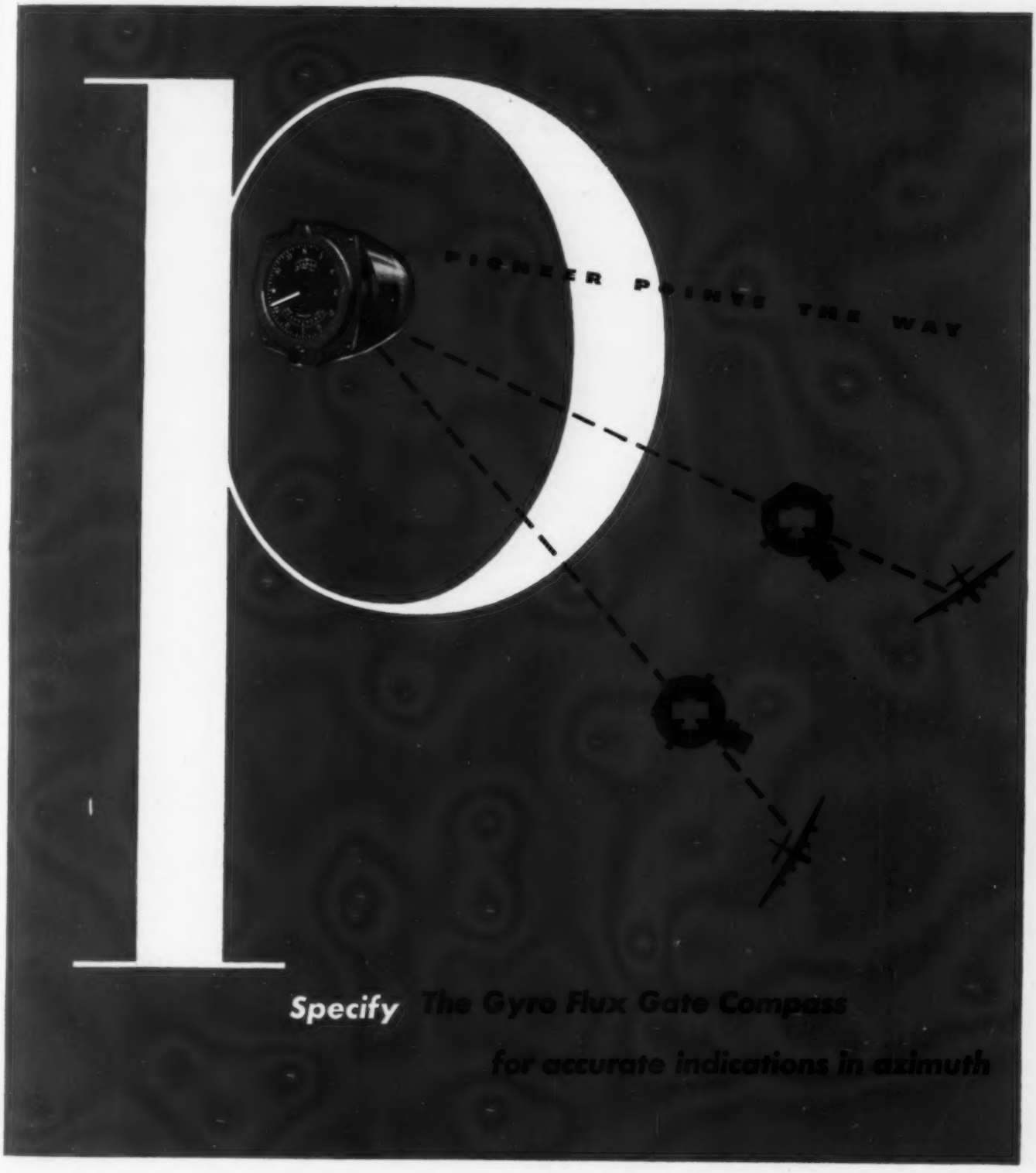
Greensboro-High Point, N. C.

★

HAWTHORNE—*The South's Finest Name in* AVIATION



Specifications for long-range aircraft call for the installation of the Pioneer Gyro Flux Gate Compass System because its master direction-indicator readings are steady and accurate in steep dives, fast turns, rough weather, or near the earth's poles. The Gyro Flux Gate Compass is a product of a great Creative Engineering team—a contribution of Pioneer's combined skills in mechanics, electro-mechanics, electro-magnetics, and electronics, . . . Month by month, as flying becomes safer, Pioneer points the way.

PIONEER INSTRUMENTS
Bendix, Pioneer, Gyro Flux Gate are trademarks of Bendix Aviation Corporation

ECLIPSE-PIONEER DIVISION
Teterboro, N. J.

Bendix
AVIATION CORPORATION

The Birdmen's Perch

LAST MONTH we showed you the commission as Perch Pilot (br) which you get for 1 Little Known Fact About Well Known Planes. But this month's commission is a Senior Perch Pilot's, which takes 5 Little Known Facts. 5 that are good enough to print, we mean.

We put Robert Edward Fielding's name in there just to show him what it would look like. Because he's got only four more Little Known F.A.W.K.P. to go. He got his Perch Pilot (br) rating with this "Fact":

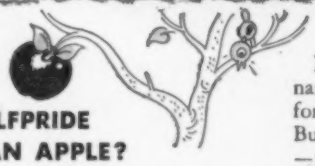
There is a fighter known as the XP-57 which is a low-wing, tricycle landing-gear, radial engine job. Never heard of it? It's really just a P-39 fitted out with a radial for experimental purposes.

Thank you, Bob. Your commission is on the way to 7402 - 21st Ave., Brooklyn 4, N. Y.

That right?

Major Al Williams,

alias "Tattered Wing Tips," Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.



WHY IS GULFPRIDE LIKE AN APPLE?

Suppose you had a red, round, rosy apple.

Suppose you got a knife and peeled that apple. Would your apple be 100% good for eating?

Nossir! Hidden inside there'd be seeds and filaments that would maybe give you a toothache. But if you added another step to peeling—took out the core—what you had left

would be good for eating down to the last particle!

Suppose you had a red, round drum of crude oil. Suppose you refined that oil. Would your oil be 100% good for lubrication?

Nossir! Hidden inside—away from ordinary refining—there'd be carbon-and-sludge-formers that would maybe give you trouble. But if you added another step to the refining—the Alchlor Process—*you'd get a high per cent of those impurities out!*

And what you had left would be Gulfpride!

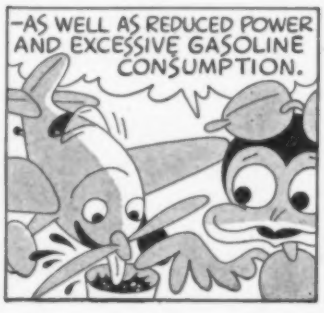
We in the Petroleum Industry are in a position to understand America's Pacific war with peculiar clarity. We know how desperate the problems of distance are, because virtually everything we manufacture or compound travels to war. So can we remind you that nothing will make the Jap happier than to know that we've begun to ease up? Can we remind you that we're still losing sons? Of the importance of your war job? Your War Bond? Your gift of blood to the Red Cross?

Al Williams

Gulf Oil Corporation and Gulf Refining Company...makers of

GULF AVIATION PRODUCTS

OIL IS AMMUNITION—USE IT WISELY



Hydraulic Retractable Landing Gear ..... with 3 Safety Features

Wide (7′ 2″) tread and the large wheels and 6.00 x 6 tires give exceptional ground stability. The new Goodyear hydraulic brakes are designed for quick, low cost servicing without removing wheels.

Choose the economical ***New Swift*** for your personal plane and enjoy the advantage of big-plane features . . . one of which is hydraulic retractable landing gear, sturdily built and designed with ***three*** safety features: (1) red and green lights on instrument panel indicating position of each wheel, (2) auxiliary manual mechanism for lowering wheels, (3) spring loaded pins that automatically lock wheels in down position.

Struts are hydraulic with steel cushioning springs . . . and long enough and at sufficient angle to throw the wheels well forward with weight on the sturdy tail wheel . . . giving extra stability in landing on rough ground or when brakes are applied quickly. Standard size 6.00 x 6 airplane tires help make landings safe and comfortable . . . and the extra sturdy shock-strut tail wheel, a special ***Swift*** feature, makes smooth landings easier and helps the ***Swift*** taxi smoothly.

You'll be be proud of your ***Swift*** and you won't be satisfied with a plane that offers you less than the ***Swift's*** many advantages. The ***Swift*** will be ready soon after conditions permit the manufacture of personal airplanes.

The Swift

de by GLOBE AIRCRAFT CORPORATION Fort Worth, Texas

Free Booklet . . . Mail the coupon today for free illustrated booklet describing the New Swift, no obligation.

Globe Aircraft Corporation
P. O. Box 4277-S
Fort Worth 6, Texas

Name .....

Address .....

City ..... Zone ... State .....

Revving Up

SURPLUS "JUNK" DISPOSAL SCORED: Among the many letters received on the subject of SOUTHERN FLIGHT'S surplus aircraft disposal stand is the following from an old subscriber who has been in the business for many years:

"Don't lay that torch down yet. The CAA will still have a large stake in the matter of surplus airplane sales long after they turn the job of selling the 'heaps' over to DPC. And now that you have started you have merely touched the fringes.

"A principal function of the CAA is to protect the flier and the airplane owner. The CAA has a more important job in protecting the general public and the public's property.

"Should the CAA permit unsafe planes to be flown from the DPC sales base to the new owner's home, that ain't good. Such craft should only be trucked or shipped. Merely because some WTS employe ferried a broken down plane from X to the DPC sales center and didn't break his neck or damage someone's property, does not prove that the same plane can continue to be ferried around the country from now on without something letting go. On the contrary, such craft become more unsafe from such a flight.

"Of late I have seen planes coming in to a repair depot from a CAA sales base that look like war babies with a swell case of battle fatigue. One ship needed two spars. Another had all rudder ribs rusted nearly half through. One had water in the rudder which tended to put the plane in a mighty fine position when the pilot made his first steep turn. Others had drain holes in the wings and controls sealed. Flaps not operating. Gas tanks with plenty of water in them. Bum oleos. Rotten fabric. Cracked tubing. Shucks, you have seen them or would not have taken up the case.

"I am for trying to keep the purchasers' costs down and I know that his costs for trucking some of these war weary planes are going to be considerably more than if he could fly the darn things home. But isn't this false economy? And will not the CAA be a potential partner to a crime? They invite participation in any accident that happens to any purchaser by giving him a waiver to fly the junk home for repairs and fail in their trust to the general public."

★ ★ ★

THAT POST STORY: We recently had a talk with Wesley Price, who wrote the brutally frank Saturday Evening Post article revealing all the headaches of lightplane cross-country flying. About 80 per cent of reactions to his blast are complimentary, he states. "There are some," says Price, "who accuse me of injuring aviation. Well, when the Post's photo editor read the piece, he started to take flying lessons and has about six hours in his log. If that's hurting the business, somebody's nuts!" Price believes he's the only writer in history to get his expense account published.

★ ★ ★

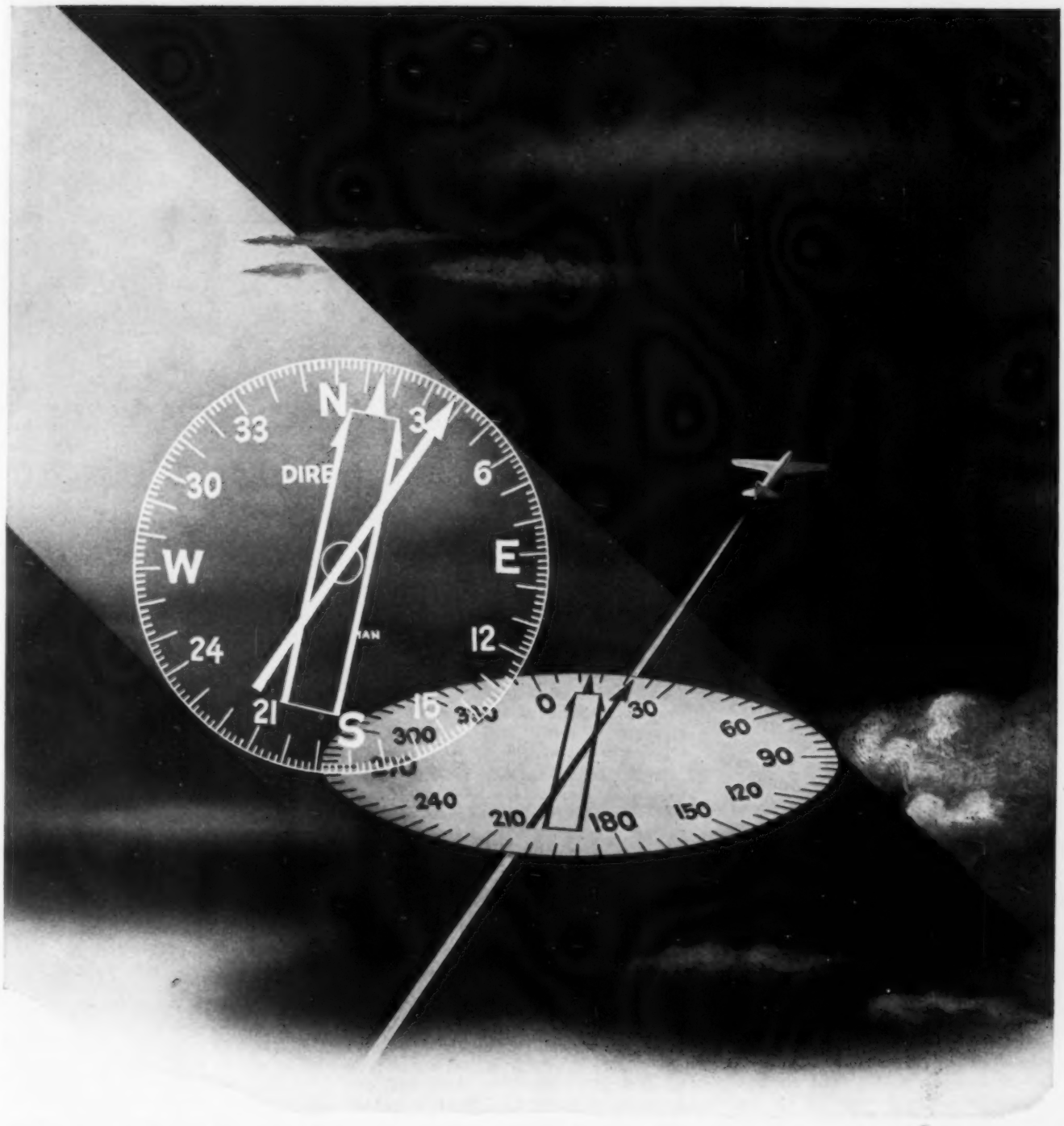
TEXAS LEGISLATION: The State of Texas is one of the few among the forty-eight states still without civil aviation legislation or some type of aeronautics commission. However, recommendations are now being made by the aviation committee of the Governor's Postwar Economic Planning Commission for intelligent and progressive aviation legislation. The recommendations call for the appointment of a non-political, non-paid commission of three people with broad aviation background and experience. The commission in turn would hire a paid executive director and other personnel deemed necessary for proper development of civil aviation within the state. Major activity would be in new airport construction, improvement, and zoning. Legislation proposing the duplication of Federal civil aeronautics acts would not be tolerated. The Commission would be charged with the responsibility of encouraging the development and promotion of all phases of aviation including manufacturing, air transport operations, non-scheduled civil aviation, private flying, technical research and education. It would co-ordinate its activities with all other Federal and State agencies dealing with aeronautical matters which affect the State of Texas. Terms of the three members would be staggered by two year appointments. Under this system the original commission would be composed of one member serving two years, another serving four years and the third, six years. Every two years a new member would be appointed. If these recommendations are acceptable to the Planning Commission, the Governor and to the Legislature, Texas the last major "hold-out" state on the matter of aviation legislation, will be listed in the "conformist" column.

★ ★ ★

THAT OTHERS MAY LIVE AND FLY: Lockheed Test Pilot Milo Burcham was killed last month while flying a new and highly secret fighter airplane. His death was a severe shock to a host of friends and admirers in aviation throughout the world. His loss to the science and art of flight testing is comparable only to the tragic death of Boeing Test Pilot Eddie Allen last year.

Like Eddie, Milo Burcham was "tops". And like all the great test pilots who have gone before him while in the line of duty, Milo's contributions to the winning of this war are as tangible as those heroes who fight and die in combat. Someday, maybe an appropriate memorial will be erected in honor to the American test pilot and his profession, in recognition of one of the toughest missions in World War II.

"Yeah, but what TIME is it?"



SIMPLIFIED COMPASS INDICATION for the pilot is one of the features of the Kollsman Direction Indicator. This new direct reading, easy-to-read, easy-to-follow compass has a convenient reference pointer that can be set to the desired course making it necessary only to "match pointers." It is regarded by many pilots as one of the greatest steps taken to simplify cross country navigation for the pilot. For an illustrated folder on this original Kollsman development, write Kollsman Instrument Division, 80-08 45th Avenue, Elmhurst, New York.

KOLLSMAN AIRCRAFT INSTRUMENTS

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THE Sky's the Limit

BY BILL GREEN

We've seen some of the new planes . . . There are two schools of thought . . . Design for servicing needed . . . Some essentials of an ideal cross-country airplane.

Private Airplanes of the Future

In the last few weeks we have seen a couple of the examples of the airplanes manufacturers are planning to sell us in the days after the war. The two we saw exemplified the two schools of thought about the private airplane of the future.

There are those people who conceive that this postwar private airplane should have an extremely cheap first cost, and should operate very cheaply. This means that it has to have a small engine (75 to 90 hp.); the accessories and comforts and conveniences and cruising speed and cruising range have all to be cut down to the bare minimum.

Then there are those who believe that if an airplane is really going to be worth something and be useful in a semi-commercial way, then it will have to carry more gasoline, more people, more accessories. And that means a bigger engine (say 165-225 hp.). This means larger first cost—and somewhat greater operating cost, although not necessarily in the same proportion.

Airplanes in both categories will in all likelihood be sold in profusion, as well as many in between and some a lot larger. Many 300-450-horsepower airplanes were sold in the thirties. These airplanes cost up to $25,000, for a single-engine model, fully equipped. Airplanes in the 165 to 225 hp. class cost from $5,000 to $10,000. The lighter ships cost from $1,250 to $5,000. Most of them cost below $2,000 and were primarily intended as trainers. They had room for two without much baggage or gas capacity. I have heard stories of ferry trips with these ships, where the towns were farther apart than their gas capacity and they had to land in all sorts of out-of-the-way places, sometimes cracking up. This sort of ship is not useful for any considerable amount of cross-country work.

Surprisingly enough, the new airplanes have little or nothing to offer over the prewar stuff except speed. They look about the same, they have similar equipment, and they are going to cost up in the money. Of the two we saw, one a 75 hp., two-place side-by-side job with twenty-five gallons of gas, retracting gear and cruising speed about 150 mph., will sell for about $3,000. It compares with the prewar Culver, but has some advantages—more gas, controllable prop (Roby), hydraulic lift on the gear, flaps, and more comfortable cabin arrangement. The other is an 85 hp., three-place, side-by-side, with constant speed prop, top speed of 200 and cruising of 175 mph. easy, according to the designer. This job has tricycle retractable gear, fifty-six gallons of gas (enough to take it 1,100 miles at cruising speed) and has an awful lot of little engineering refinements that will really make it a pleasure to own. It is expected to sell for about $5,000.

Some other manufacturers have somewhat similar ideas—it probably will boil down to many of them selling the same package with a slightly different assortment of advantages and gadgets.

A long time ago we wrote that we were violently opposed to those manufacturers who put in a lot of gingerbread and gadgets that would not hold up. The first cost of an airplane may be enticing, but when it is all said and done, you frequently spend more money on a junk heap than you do on a first class airplane—and still don't have anything to show for the money. The one real difficulty of trying to design and build a lightplane is that there is so little useful load that most designers skimp on the durability angle, with a consequent increase in upkeep cost. Examples of this are the thin windshields that buckle so you can't see through them, and the thin metal used in cowling and fairing. This cracks and the rivet and screw holes tear out after a little while, so they have continually to be patched and replaced. We don't know whether this means that small ships will always be minus a lot of the things that one really needs for long cross-country trips, but we think that something will always have to be sacrificed until either completely new materials or new designs are produced. These are not yet in evidence with the single exception of the jet engine. It is possible that jet-propelled aircraft, in any size, will be considerably lighter than conventional propeller-driven planes. Presently, however, it is said that they use more fuel, so this may not result in an overall saving.

All cross-country airplanes that can really give satisfaction need at least the following: Enough gasoline to go 600 miles or more; two-way radio with at least 150 miles normal daylight range (most of them do well to get 50 miles); enough good, properly installed instruments to be able to do a bit of instrument flying; night-flying equipment including instrument panel lights, landing lights and flares. If it is going to be fast, with reasonable power, the gear must be retractable. The plane ought to have a constant-speed or at least a controllable propeller. The good cross-country plane should be able to do about 140-160 miles per hour—more if the premium isn't too much. It should haul at least three people with plenty of baggage space and capacity.

Servicing of personal aircraft is far more important than most people realize. Most airplanes have about everything on them tied to nearly everything else so that to get to anything—or to look at most anything—you practically have to take the airplane all apart. That is responsible for the 100-hour check business—it takes 100 hours to see everything and put it back. We once had a $6,000 airplane and in order to take the generator off for repairs, it was necessary to loosen all the engine-mounting bolts. Mechanics really cussed that baby. If mechanics don't like an airplane or an engine, you had better move, because you won't have any satisfaction with it there. The manufacturers are responsible for the mechanics' likes and dislikes. They can easily solve most of the difficult servicing problems by a little engineering. Chances are that such engineering will also help them make more profit on the original assembly.

Anyway, both the new airplanes we started out to talk about had a lot of nice features. Good, substantial, simple retracting gears are some-

(Continued on page 76)

Another FIRST IN AVIATION—

This Time for Young Women!

Oliver L. Parks Announces the Opening of a Resident School of the Air for Young Women Exclusively, at the Alabama Institute of Aeronautics

This resident school of the air has been established for young women exclusively. It is in recognition of the dominant part to be played by young women in the age of personal flying. Courses offered you in flight instruction and ground school training lead to a CAA Private Pilot's Rating in a 12 weeks' course of training. For students who desire it, advanced training is available, leading to the Commercial Pilot's Rating.

Your flight and ground school training at Alabama Institute will be on the same colorful campus where, for the past 5 years, U. S. Army Air Force Cadet, Royal Air Force Cadet, Free French Cadet, Civil Pilot, and War Service Training has been given. You will study under the same competent, experienced instructors who successfully graduated 100% of the members of the original Civil Pilot Training class in 1939. You will have the advantage of the experience gained since then in flying over a quarter million hours in flight instruction.

For the 12 weeks of your training, you will live on the attractive school campus. The comfortable, home-like resident halls are under the supervision of qualified house counselors.

Alabama Institute of Aeronautics—the resident flying school for young women exclusively—is an affiliate organization of the well-known Parks Air College for young men at East St. Louis, Ill.

Write for catalog which provides detailed information. Classes begin January 8, February 19, and April 2.

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Hargrove Van de Graaff Field
2½ miles west from the heart of downtown Tuscaloosa

OLIVER L. PARKS,
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A nationally known educator and lecturer who has pioneered in Aeronautical Education and Training.

WALTER P. THORPE,
Vice-President and Superintendent
For 17 years associated with Parks Air College and actively engaged in Aeronautical Education and Training.

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Tuscaloosa, Alabama

Please send me your catalog giving complete details of the courses offered in commercial aviation training.

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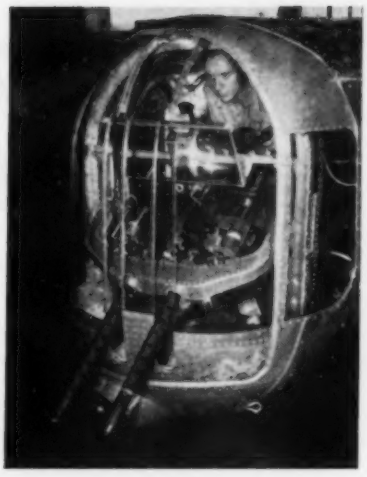
Address .....

City ..... Zone ..... State .....

Air Views in the News

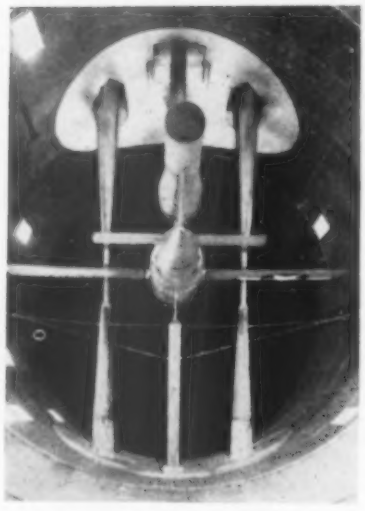
FIRST PHOTO OF GLOBE'S "SWIFT" was released last month—this view of Hans Groenhoff, famous aviation photographer, who stopped in Ft. Worth to photograph the Swift and was himself snapped by the company lensman. Groenhoff got a full round of all-over shots, including some nifty flight photos, but they haven't been released yet.

—(D. B. Green Photo.)



NEW TAIL TURRET for B-24 provides hand-held twin fifties, increases cone of fire and saves over 200 pounds formerly needed for power turret installation.

—(Consolidated Vultee Photo.)



U. S. ROBOT BOMBS are being manufactured, it was announced last month, whereupon the AAF Air Technical Service Command revealed it had reproduced the Nazi V-1 four months ago at Wright Field. First view of the AAF robot copy is shown above (from rear) in AAF's 700-mph. wind tunnel. High officers emphasized the AAF isn't interested in firing robot bombs aimlessly and inaccurately against the enemy, indicating the AAF robot is controlled more accurately in flight than the V-1. At right is a British drawing of the Nazi weapon.

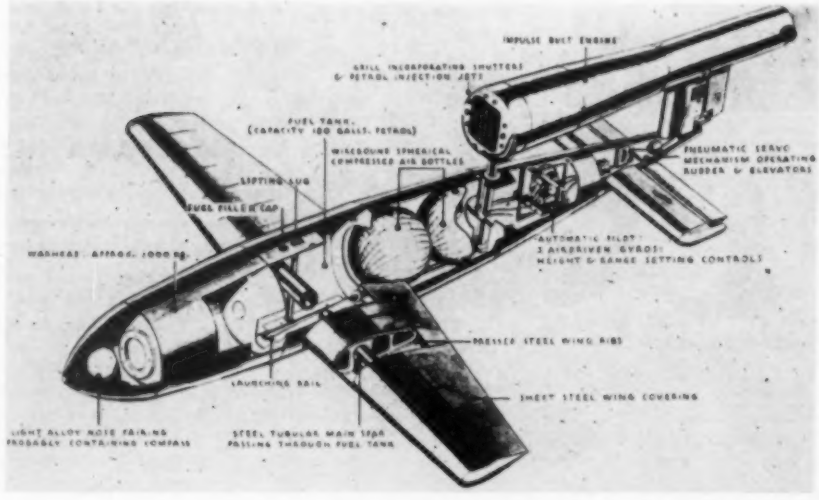
—(Top Photo by AAF Air Technical Service Command; Right Photo by British Relief Society.)

GIANT PILLOW JACK to lift heavy planes on soft ground or after crash landing is newest AAF aid for maintenance crews. Pillow jacks, which gently lift plane when inflated with air, were originated by Germans, improved by AAF, and are said to be simpler to use than hydraulic jacks.

—(AAFATSC Photo.)

SKY HOOK DROP BOX carries 65-lb. cargo of emergency supplies and, falling like a maple leaf seed, drops more accurately than a 'chute container. Lt. Col. Verne Stewart is shown examining it after Wright Field experiment.

—(AAFATSC Photo.)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GRILL INCORPORATING SHUTTERS & PETROL INJECTION JETS
FUEL TANK (CAPACITY 100 GALLS. PETROL)
WIRE-BOUND SPHERICAL COMPRESSED AIR BOTTLES
PNEUMATIC SERVO MECHANISM OPERATING RUDDER & ELEVATORS
SIGHTING VANE
FUEL FILLER CAP
WARHEAD APPROX. 1000 LB.
AUTOMATIC PILOT: 3 AIR-DRIVEN GYROS: HEIGHT & RANGE SETTING CONTROLS
PRESSED STEEL WING RIBS
LAUNCHING RAIL
SHEET STEEL WING COVERING
LIGHT ALLOY NOSE FAIRING PROBABLY CONTAINING COMPASS
STEEL TUBULAR MAIN SPAR PASSING THROUGH FUEL TANK

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Supply DIVISION *Most complete stocks of aircraft supplies, engine parts, propellers and accessories, strategically located for fast delivery.*

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KANSAS CITY	*1628 McGee Street*

TO FIGHT THERE AND BACK

In this war pilots often fight far over enemy territory, hundreds of miles from their base. So fighter planes need range as well as sting. ★ In such sorties the Allison engine has proved its mettle. Its economy adds miles to every tankful. Its dependability keeps it in the fight, helps get both plane and pilot back from hazardous encounters. Its smoothness and response lessen pilot fatigue. ★ Qualities like these will continue in importance after the war's end. They will contribute to the comfort and safety of your flights in the days of great air transport to come.

POWERED BY ALLISON
P-38—Lightning
P-39—Airacobra
P-40—Warhawk
A-36 and P-51—Mustang
P-63—Kingcobra

More than 60,000 Allison engines have been built for the above planes of the U. S. Army Air Forces.

LIQUID-COOLED AIRCRAFT ENGINES

Allison

DIVISION OF

Indianapolis, Indiana

GM GENERAL MOTORS

KEEP AMERICA STRONG
BUY MORE WAR BONDS

Every Sunday Afternoon
GENERAL MOTORS SYMPHONY OF THE AIR — *NBC Network*

CAL-AERO
TECHNICAL INSTITUTE
is the new name of
CURTISS TECHNICAL WRIGHT INSTITUTE

MAJOR C. C. MOSELEY, PRES. SINCE 1929

GRAND CENTRAL AIR TERMINAL .... GLENDALE 1, CALIFORNIA

SINCE 1929--THE BEST TO BE HAD IN SPECIALIZED TRAINING--FOR YOUR
AVIATION CAREER

Never was it more opportune for you to get into Aviation! Its future is clear, definite, assured. Military air transport lines have proven the airplane to be an indispensable factor. AMERICA IS GOING TO FLY—for pleasure, for business, for commerce. Prepare yourself now for your career in post-war aviation.

"CAL-AERO" has purchased GRAND CENTRAL AIR TERMINAL in GLENDALE, CALIFORNIA, the home of Curtiss-Wright Technical Institute. The Curtiss-Wright Corporation originally acquired this airport, in 1929 at a cost of almost $3,000,000.

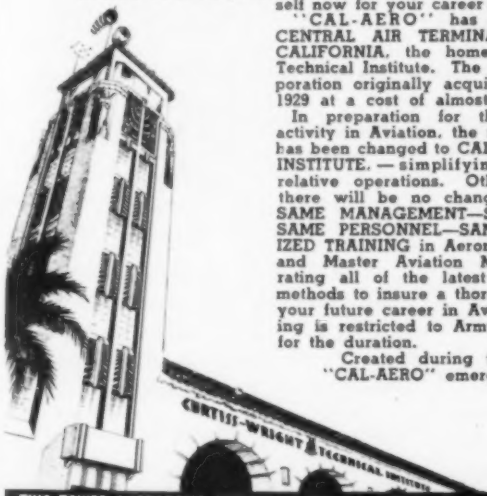
In preparation for the great post-war activity in Aviation, the name of this school has been changed to CAL-AERO TECHNICAL INSTITUTE, — simplifying and coordinating relative operations. Other than in name, there will be no change in the school.— SAME MANAGEMENT—SAME LOCATION—SAME PERSONNEL—SAME FINE SPECIALIZED TRAINING in Aeronautical Engineering and Master Aviation Mechanics, incorporating all of the latest developments and methods to insure a thorough foundation for your future career in Aviation. Flight training is restricted to Army Air Force Cadets for the duration.

Created during the war, the name "CAL-AERO" emerges symbolic of the highest standards in Aviation training. With an unmatched and unparalleled record of efficiency and safety in training more than 20,000 pilots for the Army Air Forces, together with this school's record of training 7,500 ground-crew men, at the same time, graduating thousands of civilians for the production front; these schools under the personal direction of Major C. C. Moseley since 1929, have been highly honored by citations for distinguished service in training men for the Army Air Forces.

In view of the co-related activities of these two schools in Aviation, with their honored record of war effort, it is but natural in planning, for the post-war period, that the technical phase of Aviation training should come under the distinguished name of "CAL-AERO". It will continue as heretofore, since 1929, under the personal direction of Major C. C. Moseley, on its own airport,— Grand Central Air Terminal in the heart of Southern California's giant aircraft industry.

As a result, CAL-AERO TECHNICAL INSTITUTE, with its honored war record and continuous service of training civilian students since 1929, emerges larger, stronger and finer than ever before. Civilian students have continued to enroll into this school during the war from many states and foreign nations, despite the difficulties of wartime travel. Returning service men, anxious to fit themselves for an outstanding place in post-war Aviation, likewise are enrolling upon discharge.

And so, as this distinguished old school of Aeronautics enters the post-war era, it does so with a distinguished new name,—CAL-AERO TECHNICAL INSTITUTE—a name that, in the supreme test of war has come to signify a new standard in Aviation training.



THIS TOWER OVERLOOKS AVIATION'S MOST DISTINGUISHED SCHOOL OF AERONAUTICS

CAL-AERO TECHNICAL INSTITUTE

FORMERLY CURTISS-WRIGHT TECHNICAL INSTITUTE

GRAND CENTRAL AIR TERMINAL
1220 AIRWAY, GLENDALE 1, CALIFORNIA
(LOS ANGELES COUNTY)

UNDER PERSONAL SUPERVISION OF MAJOR C. C. MOSELEY, PRESIDENT AND FOUNDER, SINCE 1929

ON OUR OWN AIRPORT - IN THE HEART OF THE AIRCRAFT INDUSTRY

BE WISE—PROTECT YOUR FUTURE

MAIL TODAY • DON'T DELAY

WITHOUT COST OR OBLIGATION SEND ME FULL INFORMATION AND CATALOG ON THE COURSE CHECKED BELOW

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- ☐ MASTER AVIATION MECHANIC COURSE
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- ☐ SPECIALIZED AIRPLANE COURSE
- ☐ POST GRADUATE AERONAUTICAL ENGINEERING COURSE
- ☐ SPECIALIZED AIRCRAFT SHEET METAL COURSE
- ☐ AERONAUTICAL DRAFTING COURSE, HOME STUDY
- ☐ AIRCRAFT BLUE PRINT READING COURSE, HOME STUDY

NAME _____

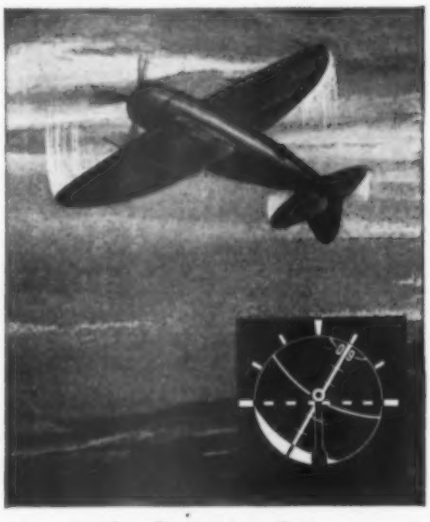
ADDRESS _____

CITY _____ STATE _____

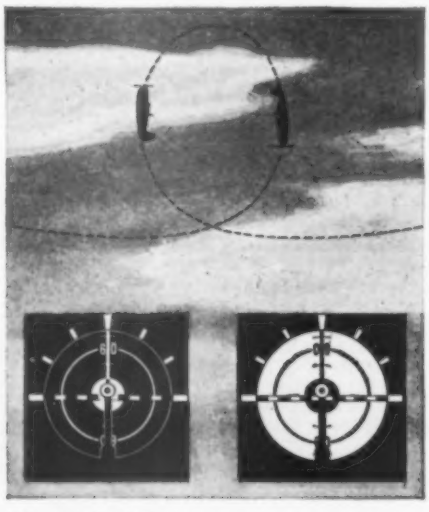
DATE OF BIRTH _____

SF 11

Pattern indication gives the pilot a visual "picture" of his attitude at all times, regardless of the degree of bank, climb, or dive.



No angular limitations! The Sperry Attitude Gyro indicates pitch and bank without any angular limitations!



No caging! Because there are no angular limitations, the instrument *never* has to be caged . . . not even in acrobatics!

Attitude Unlimited!

New Sperry Attitude Gyro provides pattern indication . . . has no angular limits . . . needs no caging!

WITH THE NEW Sperry Attitude Gyro Indicator a pilot can, *for the first time,* loop, roll, dive, climb, or fly at any angle with visibility zero, and still always know the attitude of his plane relative to the earth.

The spherical dial is marked to provide the same "pattern" type of indication whether by daylight or by any artificial light . . . a single glance tells the story.

The suspension for the spherical dial of this new Sperry instrument allows full 360° freedom of indication in the roll and pitch axes of the airplane.

A small gyro spinning at 23,500 r.p.m. stabilizes the sphere and keeps it erect in relation to the earth's surface. *The airplane actually maneuvers around the indicating sphere.*

The Sperry Attitude Gyro makes instrument flying safer, easier, and facilitates maneuvers and acrobatic training.

With it there is no possibility of the gyro's tumbling, even in extremely turbulent air. And, of course, its advantages in combat are obvious.

Sperry Gyroscope Company INC.

GREAT NECK, NEW YORK • DIVISION OF THE SPERRY CORPORATION

Gyroscopics • Electronics • Automatic Computation • Servo-Mechanisms

FOR FIGHTING GRASSHOPPERS TODAY

ESSO

Humble-Esso Aviation Products

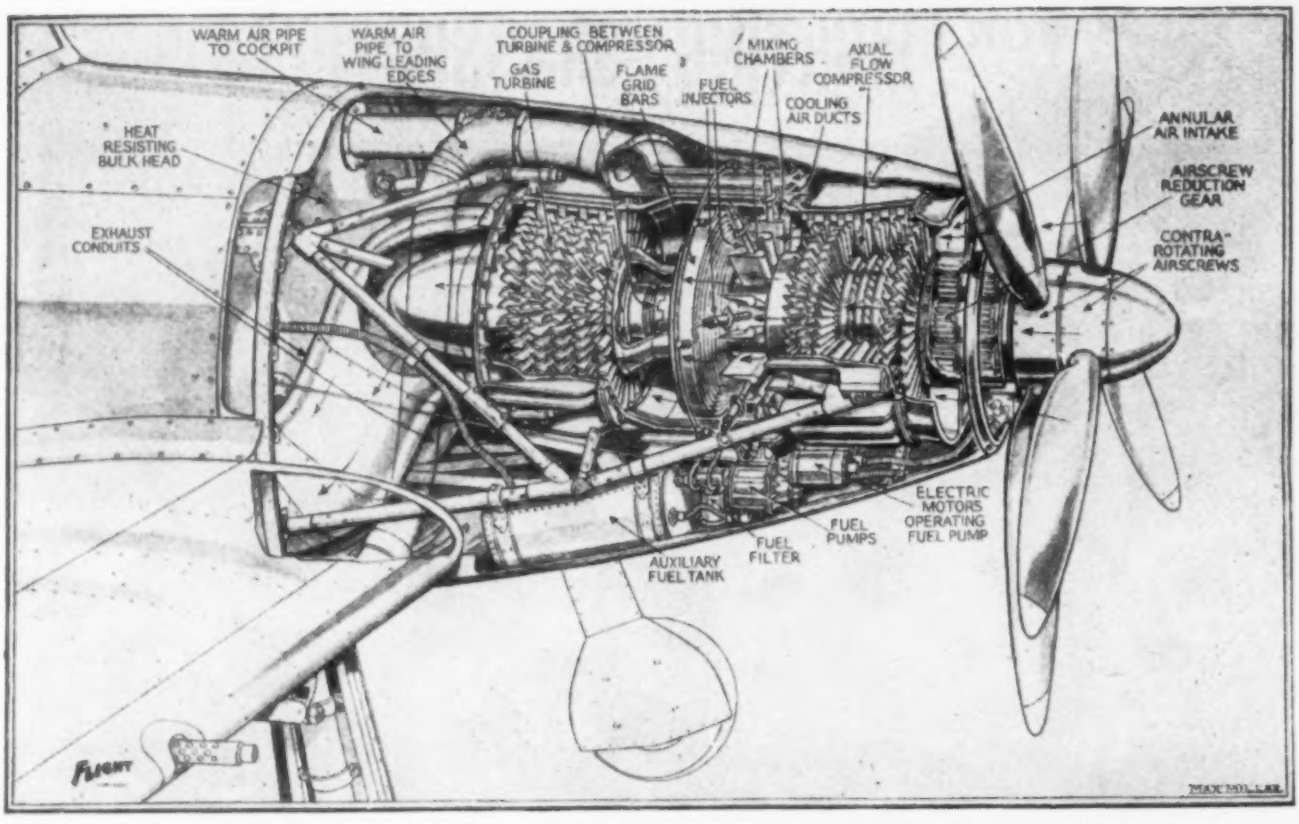
Today Humble-Esso Aviation Products serve the vital demands of war; tomorrow they will serve equally well the needs of peace.

FOR FLYING FLIVVERS TOMORROW

In World War II American light airplanes have become an important part of our fighting air forces. These gallant midgets have done an outstanding job as reconnaissance, liaison and artillery observation planes.

Humble Esso Aviation Products are now serving these light planes as well as their heavier brothers. In peacetime, Humble will continue to custom-build finer fuels and lubricants for the many types of aircraft that post-war days will bring.

HUMBLE OIL & REFINING COMPANY



Development of combustion gas turbine engines for aircraft is being intensified, with Wright Aeronautical the first U. S. firm to reveal such work. Here's a suggested nose installation for a fighter, illustrating turbine features and compactness.
—(From Gas Turbines and Jet Propulsion for Aircraft, Published by Aerosphere, Inc., N. Y. C.)

Horsepower Outlook

Fewer overhauls, reduced weight, lower fuel consumption and versatility will feature postwar engines.

By TOM GULLETTE

WHAT'S ahead in the field of power? Are the reciprocating engines, both liquid and air-cooled on the way out? What about gas turbines and jets?

Such questions make up much of the quiz programs on postwar commercial and military aviation. And despite all that has been written on these questions in the last year or so, nobody has come up so far with answers they will guarantee. However, the entire pattern of engine development from the first flights to the time of World War II, plus the intensive development and research necessary in wartime, does indicate a number of broad trends which the engine industry must almost inevitably follow if the United States is to hold a strong military and economical position in the air.

To see these trends in the best light a quick review is necessary, starting back at the turn of the century. The Wright brothers were at work on their liquid-cooled in-line engine, an engine which was to make possible the first flight with power. At the same time, Charles Manly was designing a radial engine for use in the airplane developed by Langley. It was a remarkably good engine, and had the plane had more efficient aerodynamic characteristics the early trend of engine development might have been completely changed. However, the Manly engine and the plane it carried crashed in the Potomac and radial engine research lay dormant for many years.

Background for Choice

While aviation was in the pioneer stage in the ten years just before World War I, the automobile began to grow into the industrial giant that it is today. In the United States more roads meant more automobiles, and more automobiles meant sales of bonds for more roads. Likewise in England, the automobile was finding widespread consumer acceptance. In both of these English-speaking nations the engine builders were too busy with automotive orders to spend much time on research for the benefit of the struggling aviation industry. In Germany and France, however, the peasants of those two strongly agricultural nations were not too eager to put their savings into autos. French and German engine industries had more time for aviation and logically assumed a strong position in the field of aircraft engines. This was largely the reason why the Liberty engine, of World War I vintage, was an outgrowth of the German Mercedes and the reason why the Wright-Martin Company built the French Hispano-Suiza under license during the same war period.

After the war, the aviation industry had better facilities and more time

for engine research. Out of such research came the radial engine. With the inception of commercial aviation the radial quickly became the commercial favorite.

Then, a curious pattern of development began to appear. Nations now had their choice of the radial or of the liquid-cooled. They began to choose one engine or another on the basis of their military needs.

England, a non-aggressor nation, wanted an air force that could defend the British Isles from continental-based bombers. Essential for this requirement was a fast, maneuverable interceptor plane. Long range was secondary to the ability to climb upstairs in a hurry and intercept raiders. Since the single seat plane was indicated for this purpose and since the liquid-cooled in-line engine was well adapted to the small fuselage cross-section of the single seater interceptor, the English military development was concentrated on liquid-cooled in-line engines.

Germany, on the other hand, was thinking in aggressive terms; *Luftwaffe* leaders knew that the nation had to be self-sufficient and that once war was declared they could not rely on any aviation gasoline imports. Lacking high-quality gasoline, one of Germany's first problems was to design engines which would carry the most bombs over comparatively short ranges with the mediocre German fuels available. German geography did not inherently favor one type of engine over another. German geography and economical resources demanded, however, that the Germans put all of their efforts into developing engines with features designed to get the most power out of poor fuels. That was why Germans worked so hard on fuel injection, cooling-fans, automatic boost controls and assisted take-offs. Their engines were not better than those of other nations, but they were definitely better for operation on low-grade fuel.

Italy for many years was a non-aggressor nation and apparently decided its military problems much similar to those of England. Such an attitude called for the use of a liquid-cooled in-line engine and the Italians had some excellent engines of this type. In mid-career, though, the Italians turned aggressor and this decision called for radial engines for long-range bombers. The decision left too little time for adequate engine development and the North African campaigns showed the Italian deficiency in this effort.

In the United States the commercial and military problems were greatly similar. America is a vast nation and long-range high speed planes were necessary to set up an adequate air transportation system over such an area. The air-cooled radial with its characteristics of high power, reliability, long service life and ease of overhaul, was the logical engine for such commercial use. The military forces likewise wanted long-range planes to strike at enemies far from our shores and the radial engine provided the power for the resulting heavy long-range bombers. The Navy wanted long-range patrol planes; again the radial was the answer. The Navy wanted high power to get fighters, dive bombers and torpedo bombers off short carrier decks, and the radial engines had this power. In-line liquid-cooled engines dropped completely from commercial use in this country and even for military use there was a lag in development for many years.

It is interesting to note that Japan analyzed its position as being much similar to that of the United States—that is, a nation which prefers to fight far from its homeland — and also placed most of its emphasis on the air-cooled radial.

Jet and Turbine Promising

Such was the prewar situation of engine development from the standpoint of national interest; such were the engines of the various belligerents in the early days of World War II.

Now a new type of power has become available. This type is represented by the jet propulsion engine, the robot or buzz bombs, and the

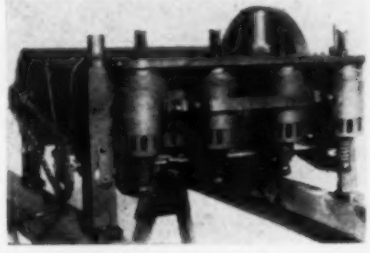
(Continued on page 75)

Wright Marks 25 Years of Progress

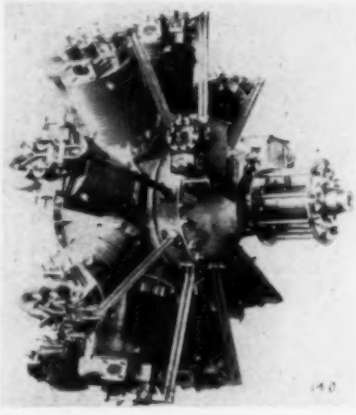
WRIGHT Aeronautical Corporation observed its 25th anniversary last month by announcing postwar aircraft turbines and continued radial development, while revealing it had produced, since October 9, 1919, over 220,000 aircraft engines—200,000 of them with a combined horsepower of 315,201,000, since September 1, 1939.

President Guy W. Vaughan said Wright gas turbines will eventually develop 10,000 hp. and declared he sees a "strong need" for postwar radials of from 400 to 5,000 hp. (biggest Wright now flying is 2,200 hp.).

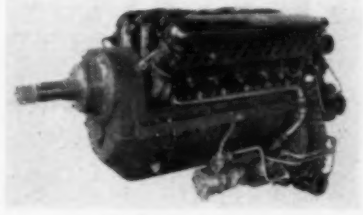
Stalwarts of Wright's 25-year production are pictured below.



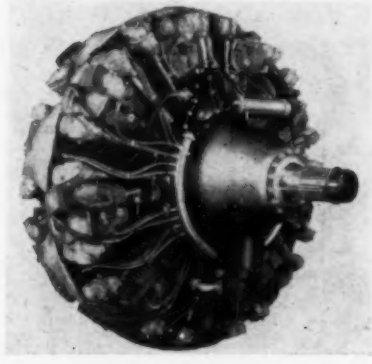
WRIGHT BROTHERS built this 12-hp. engine for their 1903 Kitty Hawk flight. It weighed between 25 and 35 lbs. per hp.



FIRST WRIGHT RADIAL, the R-1, appeared at end of World War I. It delivered 350 hp. at a weight of 884 lbs.

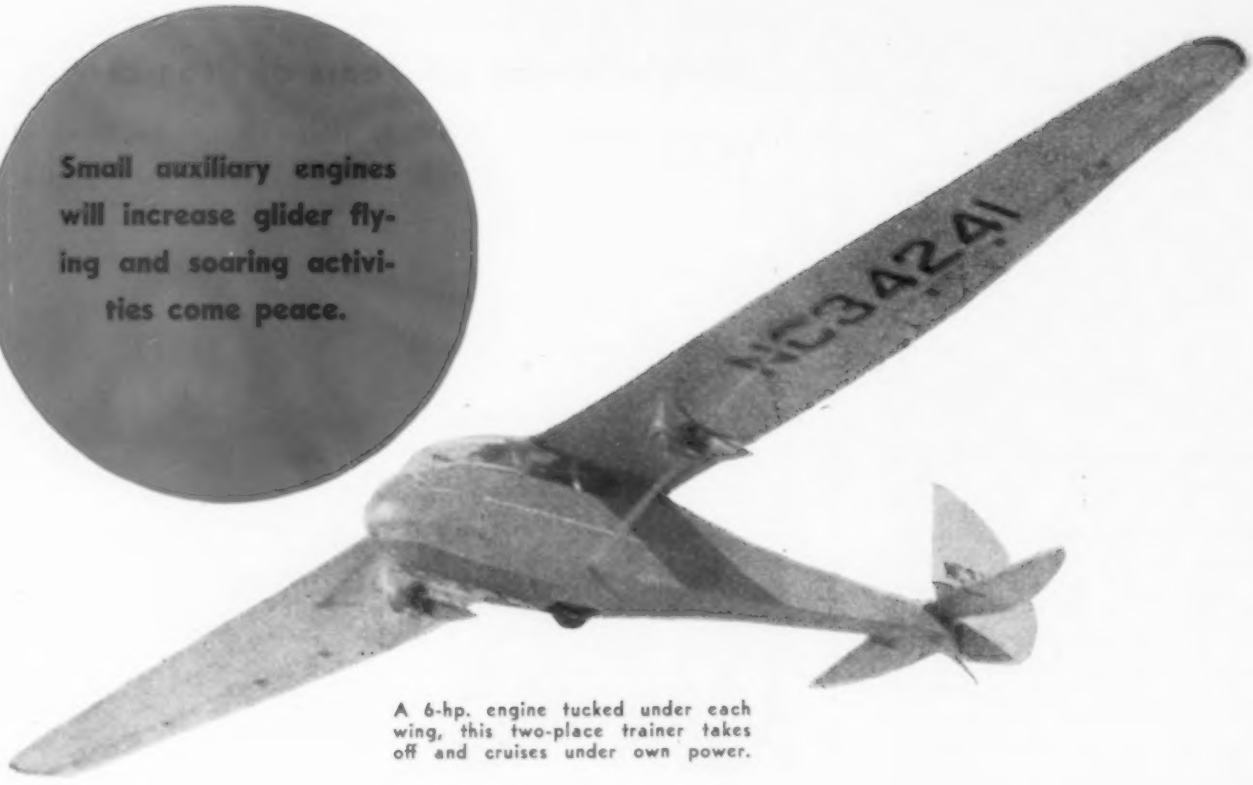


LIQUID-COOLED CONQUEROR, developing 1,000 hp. and displacing 1,570 cubic inches, was added to Wright line in 1929 after merger of Curtiss and Wright interests, but was dropped from production in 1934.



MIGHTIEST WRIGHT is Cyclone 18 (above) developing 2,200 hp. with weight fractionally over 1 lb. per hp. It powers B-29, Mars and C-69.

Small auxiliary engines will increase glider flying and soaring activities come peace.



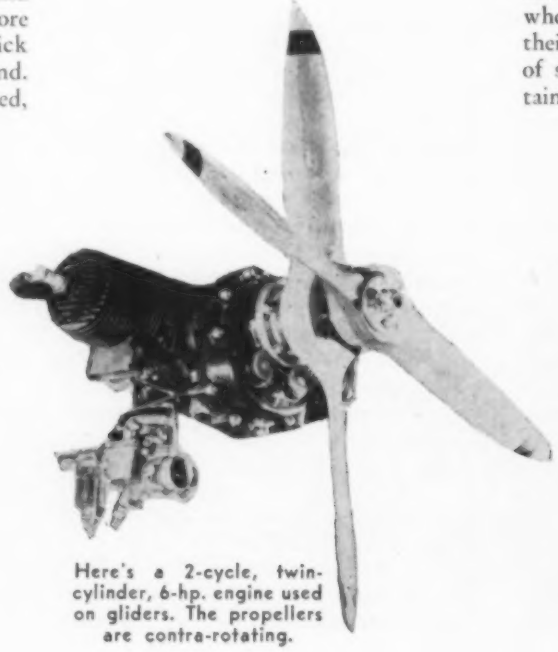
A 6-hp. engine tucked under each wing, this two-place trainer takes off and cruises under own power.

POWER FOR GLIDERS

By STANLEY R. CORCORAN
Aircraft Division, Globe Corp., Joliet, Ill.

RELATIVELY few persons who fly airplanes have experienced the thrill of motorless flight. To an airplane pilot, this is looked upon as a harrowing experience, but to the glider pilot who has no engine in his craft, it is but routine procedure and offers no particular hazard. True, the glider pilot has a craft with a higher gliding ratio and a lower sinking rate; he has more time and a better opportunity to pick the spot on which he wishes to land. The airplane pilot usually is forced, due to emergency, to make an immediate decision and land as best as he can. This basic difference between the glider and airplane enables the glider to utilize the lift encountered in thermal currents, not only to maintain altitude, but also soar to great heights.

Probably the most common method of launching a glider is by winch, and an altitude of 600 feet is attained from an average tow. With this altitude, there is relatively little time to look for a thermal and even if one is encountered, the average glider pilot finds it difficult to stay within its boundaries because of their abruptness and small diameter close to the ground. The picture is entirely different at altitudes from 2,000 to 3,000 feet, where the thermal has expanded in diameter and usually increased in velocity. At this altitude, it is not difficult, even for a student, to keep within a thermal and gain altitude. Another very satisfactory, but expensive, launching alternative is the airplane tow method, from which any desired altitude can be attained before releasing for free flight. This brings soaring within the reach of only those who are willing to spend enough of their time to become expert in the art of soaring or go to the expense of obtaining airplane tows.



Here's a 2-cycle, twin-cylinder, 6-hp. engine used on gliders. The propellers are contra-rotating.

Twin Engine Installation

In view of these apparent shortcomings of glider flying, I have conducted some experiments in making the glider solely independent of a ground crew or outside source of power for launching. These experiments and tests proved that due to the aerodynamic cleanliness and comparatively low wing-loading of the glider, little power is necessary to take off and climb to an altitude sufficiently high to take full advantage of thermal activity. For the tests, a standard two-place "Cinema" glider was equipped with two six-hp., two-cycle engines, one mounted on each strut.

Details of these unique little engines cannot be given at the present time because of security reasons covering their use in government activity. After the war they will be available, and I expect the six-hp. version, together with contra-rotating propellers, to cost less than $300. We have lately been working with an eight-hp. version. These little two-cycle power plants turn at high crankshaft speeds, the maximum being 3,800 revolutions per minute. They are very light in weight.

Each engine was equipped with individual throttle and ignition controls which were mounted in the center of the instrument panel. As the propeller wash did not strike the fin and rudder, directional control was maintained by increasing the rpm. on one engine and decreasing on the other. In this way, it was possible to taxi wherever desired. A two-wheeled landing gear was installed which gave lateral balance so that no aid was necessary to keep the wings in level position. Individual fuel tanks of one and three-quarter-gallon capacity were mounted directly behind each engine which helped to streamline each unit and was readily accessible for refueling.

The contra-rotating feature of the engines allowed the use of two propellers operating in opposite directions or a single larger propeller. This feature offered no particular advantage, as torque was of no consequence; however, it did give an opportunity to compare performance with single and co-axial propellers.

Performance tests were conducted under temperatures ranging from five degrees to ninety degrees above zero. Because the engines develop the highest rpm. at the lowest temperatures, the best performance was obtained in the low temperature range. Some difficulty was encountered in starting, but this was overcome by placing a heating unit under the engine, and covering the engine and unit with a canvas. The preheating made starting easy even under the most severe conditions.

Performance With Power

The following performance figures were compiled while flying solo, with a gross weight of 750 pounds:

Take off run	500 feet
Rate of climb first minute	150 feet
Top speed	67 mph.
Stalling speed	37 mph.
Power off glide ratio	15 to 1

With the glider loaded to a gross weight of 1,000 pounds, it was possible to take off, but it was necessary to land immediately because there was insufficient altitude to safely circle the field. At 1,000 pound gross, the power loading was eighty-three pounds per horsepower, which indicates considerable efficiency. In order to determine the rate of climb with this loading, several flights were made with assisted take-off by auto tow and the result was an average of fifty feet per minute climb.

Getting back to solo flying, it was found that the glider would maintain altitude with only one of the two engines operating and controllability was excellent at all times. At seventy miles per hour, the ignition on one or both engines could be switched on or off, as the air stream at that speed was sufficient to keep the propellers turning. No attempt was made to start the engines once they had stopped.

The results of these tests indicate that considerable development could be made in this low-powered field and still meet minimum light airplane performance requirements without sacrificing the soaring qualities. It is not being assumed that twelve horsepower would be adequate to meet the desired performance requirements, but it would no doubt be some relatively low figure.

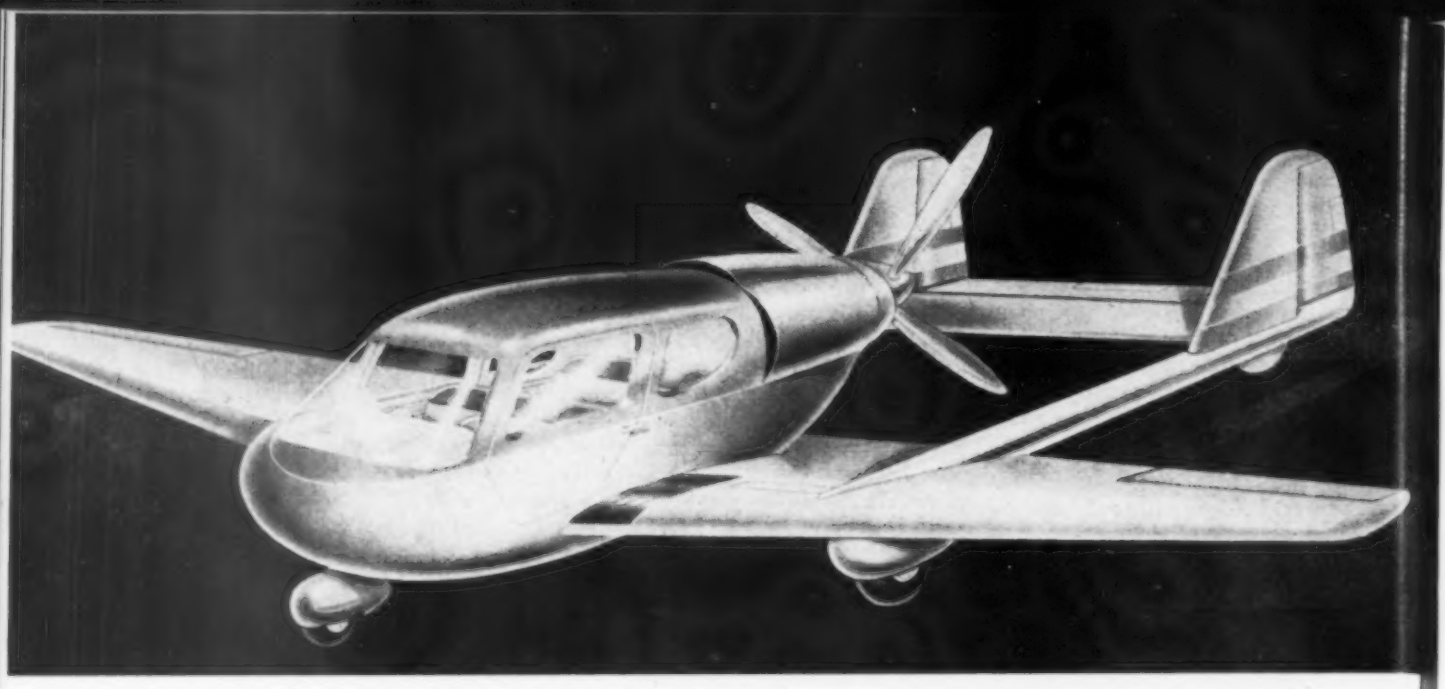
A glider so equipped would be comparable to an auxiliary powered sailboat. The powered sailboat can navigate in congested harbors and proceed to a destination when becalmed by lack of wind. The powered glider can take off from an airport, climb to any desired altitude where the engine can be stopped and continue the flight by the aid of thermals. In the event the thermal activity becomes inadequate to get to the destination or return to the starting point, the engine could be started and the flight completed under power.

An engine has already been developed with a hand-operated crank similar to those used on outboard motors for boats. To start the engine, a lever is pulled which automatically sets itself for another pull by a ratchet arrangement.

A craft of this sort would not only meet with popular approval as a primary training airplane, but also make it suitable for soaring with the power off. Its utility as a power plane would approach that of the present-day light airplane and be satisfactory for all local airport flying. The soaring pilot would then be independent of any launching equipment or crew.

There is a place for the powered glider in the flying world and it is my belief that the postwar period will see a definite trend in this direction.

POWER TAKE-OFF eliminates more expensive launching by tow plane and eliminates troublesome launching by winch or auto. Mr. Corcoran is shown above in close-up of powered glider, with engines idling.



More practical than arty is this design of a 4-place pusher for personal ownership, one of 3,345 designs submitted in a Popular Science competition. Donald J. Wheeler, an engineer with Boeing at Seattle, topped the professional division with it. The amateur division was led by a jet design (below).

—(Popular Science Monthly Drawings.)

DESIGNS BY BUYERS

Drawings and specifications featured the latest poll of opinion on postwar plane preferences. The results were impressive.

By C. B. COLBY

Aviation Editor, Popular Science Monthly.

TO attempt a "sampling" of American public opinion on any given question often is as tricky a procedure as riding a greased pig with your hands tied behind your back. The variables that can affect the result—and are not taken into account—are almost innumerable.

Popular Science Monthly has just concluded such a sampling on the question of personal airplane ownership. But whereas the assorted polls on this question, up to the moment, have invariably posed for the reader the problem of owning an airplane or not owning one, we went about the job in a different way.

The usual question is: Would you like to own an airplane? If so, what kind?

We asked: What kind of an airplane would you like to own? Describe it, or draw it, or both.

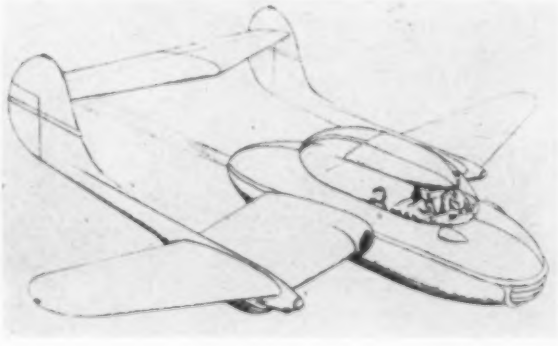
There is a world of difference between the ways in which those two questions are put. The first one buttonholes John Doe on the street and propounds to him a choice between ownership and non-ownership. The second leaves him no choice—and in so doing draws answers only from those persons who actually would like to own an airplane. That is important in analyzing the poll, as we shall see.

Twin Tails Favored

We received 3,345 answers, divided as between professional and non-professional entrants. A total of $5,000 in War Bonds was put up as prizes. First prize in each of the two categories was a $1,000 War Bond. The other prizes tapered down through $500, $300, $200, $100, $50 and $25. There were twenty-eight prizes in all in the $25 class.

Both in volume and character, the results were somewhat astounding What intrigued the judges most, perhaps, was the high percentage of designs embodying twin tail booms enclosing pusher propellers. That permits the pilot and his passenger to sit forward of the wing, with wonderful visibility. It also "builds a fence" around the propeller so that Junior can't walk into it.

Then there were other things in the answers that stuck out like sore thumbs. The contestants wanted safety. They wanted comfort, good looks, practicability and performance. A negligible percentage of what we chose to look upon as potential aircraft buyers preferred whirling-wing machines, such as helicopters. A high percentage didn't want putt-putts costing less than $1,000. They were willing to go all the way from $1,500 to



A nineteen-year old Marine private sent Popular Science this jet design for private flying from the Pacific. Twin-boomed designs were numerous in the competition, and indicated close familiarity with design problems in general.

$3,500 to get performance, capacity and ruggedness.

They wanted around 130 miles an hour, indicated. They wanted a range of around 500 miles. The preferred horsepowers ran from 110 to 200. The designs ran to low-wings, instead of mid-wings or high-wings. They were weighted heavily with tricycle undercarriages for easier landings and ease in taxiing on the ground in wind. They incorporated slots and flaps.

All this indicated the entrants were pretty well acquainted with aircraft. By the same token we believe it reflected in no small degree the size of the potential personal airplane market.

Here are some other results:

	Professional	Non-professional
Amphibious	20%	16%
Roadability	12	10
Retracting gear	53	72
Number of seats:		
Four	43	52
Two	35	32
Three	11	13
Five	7	1
Six	4	1
One	—	1
Radio	33	32
Wood or plastic constr.	7	20
Folding wings	7	14
Jet engines	3	6
Spinproof	16	14
Two-control	6	8
Self-starter	14	16
Seaplane	5	5
Twin engines	20	29
Parachutes	0	1
Dual controls	60	40
More baggage space	80	35
Heater	27	20
Good ventilation	29	15

From the foregoing it can be deduced that while the *Popular Science* contestants knew a lot about planes, they still could be catalogued as being on the average-consumer side. Anyone with a more than passing knowledge of light airplanes, for example, knows that a cabin heater is essential to comfort.

Ten per cent of the professionals and 15 per cent of the non-professionals wanted helicopters. Respectively 29 per cent and 46 per cent wanted low-wing jobs; 53 and 72 wanted tricycle landing gear; and 40 and 40 slots and flaps.

More Practical Than Fantastic

On the matter of price we were pleased to note that our survey results showed substantial agreement with that of John H. Geisse and an associate in the Department of Commerce —it was the modest income groups that owned airplanes of pretty fair price.

It was in the findings of the judges that, for the novice, the biggest surprise occurred. A nineteen-year-old Marine private named Don Leroy Fotheringham, of Idaho Falls, Ida., currently plastering the Japs in the Western Pacific, won first prize in the non-professional class with a jet-propelled job.

"Fantastic, eh?" the aviation editor of another national magazine was asked, by way of a little needling, as he viewed the exhibit of designs at a New York hotel. This particular man is a flier with several thousand hours, and has flown planes like Hellcats.

"What do you mean, fantastic?" he retorted. "The kid who designed that plane, and the judges, know what they are talking about. It won't be long now until even automobiles will have turbine-type engines. The reciprocating gasoline engine is a dodo."

In the professional class Donald J. Wheeler of Seattle, an engineer for the Boeing Aircraft Co., won first prize.

The judges were Col. Earle L. Johnson, national commander of the Civil Air Patrol; Oliver Parks of Parks Air College; Roger E. Schlemmer, chief of the aircraft engineering branch, CAA, New York; Lt. Col. Leon B. Lent, head engineer of the National Inventors Council; Arthur Wakeling, *Popular Science's* assistant editor, and myself.

All manner of interpretations can be placed on the survey. A doubting Thomas, for instance, could question the numerical response on the basis that prizes were involved. We at *Popular Science* don't consider that that was a controlling factor. By and large the designs were too good to indicate anything but an honest desire to own a plane when the war is won.

1,500,000-Plane Market Seen

What did the numerical response indicate in terms of the postwar market? Well, one way of looking at it is that perhaps 10 per cent of those readers who felt impelled to enter the contest actually did enter it. That 10 per cent overcame their ordinary inertia. The remaining 90 per cent consists of potential buyers, too.

That would sum up to more than 30,000 potential customers for the aircraft makers among our own readers alone—and bear in mind that aviation is only one of hundreds of subjects treated in our pages in the course of a year. In other words, *Popular Science* is not written for readers interested solely, or even primarily, in aviation.

On the basis of our circulation, that 30,000-plus would indicate a market of 1,500,000 vehicles in a population of 50,000,000 wage earners. Some experts may quarrel with the deduction but, as I say, that's one way of looking at the results.

I hardly need to add that of the 3,345 entries, all but about 200 fell into the non-professional class.

Young Mr. Fotheringham, the amateur winner, not only was an imaginative designer but a refreshing character as well. In a letter accompanying his entry he wrote:

"*Occupation:* Knocking hell out of the Japs so that I may return home to the following type of plane.

"*Position Held:* A Private First Class in the world's finest military organization." ★ ★ ★

Refined Silvaire Readied by Luscombe

LUSCOMBE Airplane Corporation last month revealed its first postwar lightplane will be a "highly-refined" version of the widely popular Silvaire, first all-metal lightplane manufactured on a volume basis before the war and much-sought in the used plane market, particularly in the Southwest, since Luscombe's war work on military plane parts replaced the Silvaire on the production line.

The firm has additional postwar activities in the planning stage. Leopold H. P. Klotz has returned to its management and Frederick John Knack, designer of the first Silvaires, has returned as vice president in charge of engineering. He resigned as engineer in charge of Fairchild Aircraft's New York office. A new Luscombe factory manager, chosen from one of the largest of the eastern aircraft plants, is to be announced soon, and still another important Luscombe personnel change has been appointment of Clarence L. Riegel, former General Electric Company assistant district auditor in New York, as secretary and assistant treasurer.

Luscombe since 1941 has devoted its two Trenton, N. J., plants entirely to war production of vital products including instrument panels for Vought Corsair fighters, rudders for Grumman Hellcats and Wildcats, fuel tanks for the Curtiss Commando, bomb bay doors for the Avenger, airscoops and ammunition boxes and other all-metal precision elements in which the firm has specialized.

Illustration by Joe James, Lt., USNR.

"An instructor who loses his temper had better get into some other work."

CONFESSIONS *of a Flight Instructor*

Beginning a series in which a veteran instructor tells all—for the benefit of other instructors and students as well.

By A. H. KNOUFF
Lt., A-V (T), USNR*

I HAVE a secret conviction that I am the best flight instructor in the world. I suspect that every successful instructor has the same conviction — about himself, of course — and doubt if he could be a good instructor without it. It is the challenge to this ego that makes him sweat out the errors of an awkward student instead of throwing up his hands and saying "to hell with it". If he gives up, he has to admit that he is licked, that he is not as good as he thinks he is.

If he turns the student over to another instructor, and the student turns out to be a flier after all, it is no reflection on his self-esteem. In fact it proves that he knew his business well enough to know that the methods of the second instructor were better adapted to this particular student. It is just a matter of personalities.

Before an instructor can develop this conceit, he must have the *desire* to be the best instructor in the world. About three years ago, a young man started working as an instructor to "build up" time and age required to be an airline pilot. He worked hard. He conscientiously tried to analyze his students and correct their errors. He was a good flier. Yet he had five accidents in about as many weeks. Today he is an airline captain and hasn't even had a flat tire since.

That's an extreme example, but unless you really want to be an instructor don't tackle it. You may not bust up any airplanes, but neither you nor your student will get much good out of it. You might even spoil a boy who might otherwise make a good pilot.

Instructing is one of the most fascinating jobs — and one of the most disheartening. Before the war it was one of the most pocket-breaking, as well as heart-breaking. It was something more than money that kept the old-timers in the game. After the war, with a million youngsters turning to the job as a means of keeping up their flying, the balance of the ledger is likely to be entered in red ink.

"I have a secret conviction that I am the best flight instructor in the world."

If you really have what it takes, you just can't help teaching people to fly. With 2,500 hours of dual as an instructor in my logbook, I was sick and tired of it. I was tired of going through the same old errors with each new student and saying the same old things. It seemed to me that each new crop got dumber and dumber. It was driving me crazy.

That's what I thought.

Within six weeks after I had quit my job to join the Navy—and had not yet received active duty orders—I had become irritable, unhappy, lost my appetite and my disposition. I finally found an operator whose instructor had been plucked by the draft board in the middle of a program, and who was desperate enough to take me on even though we did not know when I might be called off the job. It was one of those desert airports to which West Coast operators had to move when General DeWitt prohibited civilian flying. We had to haul our water from a spring twenty miles away, worked in lean-to hangars and hastily-built offices, ate sand, and considered a 100-degree temperature as a cold-wave. The most exciting event of the day was the nine o'clock bus stop at a filling station five miles away. But I was happy again.

Students Should Outfly Instructors

When I finally got my orders to a Naval Air Ferry Command Squadron, it seemed natural and inevitable

*Opinions and assertions herein are the author's, and are not to be construed as official or reflecting the views of the Navy Department or the naval service.

o find myself in the training divi-ion teaching younger pilots the tricks of the trade that would enable them to fly safely in a wide variety of air-planes, under almost any conditions of altitude and climate.

My egotism does not extend to my flying ability. In the first place, I was twenty-six years old before I took my first flying lesson, at which advanced age it takes longer for a man to learn new tricks. Then I am the kind of guy who has to know the reason for everything before I can do it well. It think it was mainly my realization that I was not, and never would be, a hot pilot that has kept me out of trouble.

I have often told students I would quit instructing if I couldn't teach some of them to fly better than I do. It is natural for a student to think his instructor is the best pilot there is. This makes me think of a crayon company whose competitor once had a near monopoly on the business. This company continually talked about making crayons as good as its competitor's. It got nowhere — until one of its employes argued: "No one ever achieves perfection. If you set up your competitor as a standard of perfection, your product will never be as good as his. Therefore, you must set up a standard that is better than your competitor's — the best you can imagine." The company did this, and is now a leader it the crayon business.

No matter how good a flier an instructor is, he should try to make his students fly better than he does. I have known many mediocre or poor fliers whose students were tops, and expert pilots who just couldn't put it across to others. I would almost go so far as to say that perfection of flying technique is the least important quality of a good instructor, which is in direct opposition to one of the official bulletins on the subject. I think the most important attributes of an instructor — whether it is flying or arithmetic — are the desire and ability to instruct.

I had one student who had been washed out of Army primary. At the conclusion of his first course with me, the flight examiner and I discussed his case for more than an hour before we decided that, although his technique was poor, his thoroughness and conservatism would make him a safe pilot. I had him next in an instructor course, and was so impressed with his quiet, easy manner and ability to analyze errors that we hired him to teach for us. Under his guidance, students who seemed hopeless at first turned out better than more promising students under other instructors.

"A good instructor will not hesitate to suggest changing to another."

Perhaps the memory of his own difficulty helped him understand and solve the problems of students. He has been in the Army for about two years now, most of the time as an instructor in advanced phases of flying.

I get a bigger kick out of teaching poor students than good ones. It is no honor to teach a good student, but the poor one gives me a chance to prove my belief that I am the best instructor in the world.

Barking Dogs Don't Bite

I once took over a group of students who were described as "problem children." I was told that all but one would probably wash out. It turned out that all but one got through. After a couple of hops with one of the poorest of the group, I shot him a question: "Which are you afraid of—me or the airplane?"

After some hemming and hawing, he blurted out the confession that he was scared of being yelled at by an instructor.

"Listen," I told him, "if I yell at you, it is only to make you hear me. I have no reason to get mad at you. If you make a mistake, it doesn't hurt my feelings. You are learning to fly because *you* want to — not because I want you to. My job is to help you do the thing *you* want to do." After that, he made the most rapid progress I have ever seen in a student.

An instructor who loses his temper had better get into some other work. Students don't think up errors just to plague their teacher. The student wants to be a good flier and the instructor has accepted the solemn responsibility of making him one. It is the duty of the instructor to teach the student to fly without allowing his emotions or prejudices to interfere. He cannot understand the student or analyze his errors if he gets mad at him.

I have had some students who annoyed me. I leaned over backwards in my effort to do a good job of teaching them.

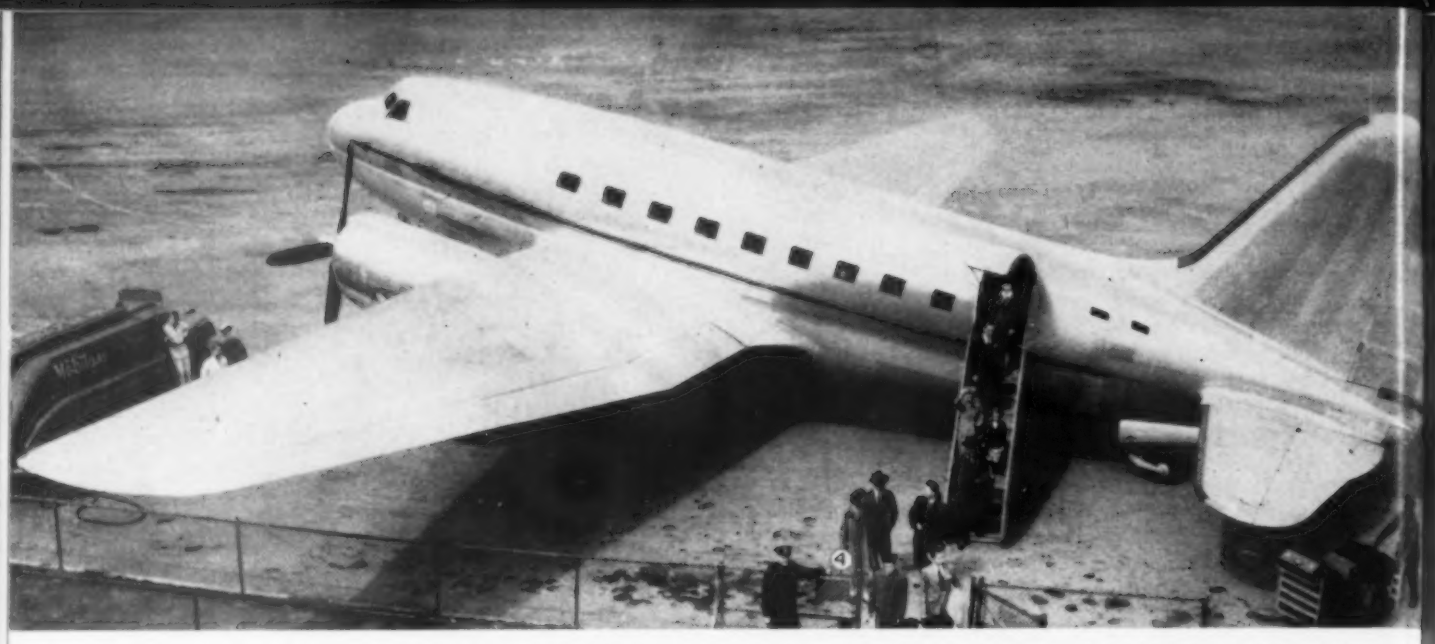
There is probably no instructor who can get the best out of *all* students. Besides personality clashes, individual differences in students require different instruction techniques. The instructor must adapt his methods of teaching to the student's method of learning. Each instructor will adopt certain methods naturally. Others he must consciously develop. There seems to be a limit to anyone's ability to do this. A good instructor will not hesitate to suggest changing to another instructor or whose personality or methods are more suitable to the particular student.

Many military pilots who take up instructing in civilian life are going to be faced with the fact that the student is the instructor's meal ticket. You teach him to fly, or you don't eat. Bad judgment or dangerous flying are practically the only grounds for a washout.

Once I gave back a customer eight dollars he had paid in advance and told him that my partner and I thought that, although he was the best student we ever had, it would be dangerous to himself and to others for him to continue to fly. I did it in such a way that we remained friends and he frequently rented our planes—as a passenger. Incidentally, the money I returned to him was all the cash we possessed.

Analyzing a student is the first and one of the most interesting problems to be met by an instructor. Let's talk about it next month, the next time we get together.

(EDITOR'S NOTE: *This is the first in a series by* LT. KNOUFF. *Comments and inquiries by readers will be welcomed.*)



Re-touched photo shows how new Curtiss CW-20E Commando transport will look when operated as airliner. Designed for medium-range traffic, it incorporates many innovations for comfort, safety and economy.
—(Curtiss-Wright Photo.)

Commandos for Commerce

By GEORGE E. HADDAWAY

Curtiss-Wright Corporation makes its bid for immediate postwar transport business with a luxurious 36-passenger development of the famous war-tested Commando — largest twin-engine transport in the world.

SOME three score nationally known aviation writers and news commentators journeyed to St. Louis late in October for impressive unveiling ceremonies of a full-size mockup of the Curtiss Commando airliner, a 240-mile-an-hour version of what's familiarly known as the C-46 in Army flying circles and the R5C in the Navy. The visiting newsmen found proof positive that a major manufacturer of warplanes was ready, willing and able to turn out commercial airplanes within a very few hours following the first green light after armistice.

It was just three years ago that Curtiss-Wright announced its new CW-20 commercial airliner, which was hastily pressed into military production and service before reaching originally intended scheduled operations over the nation's airlanes. Basically, the new Commando is the same airplane. But the constant improvement that comes from mass production, exhaustive flying experience in every kind of weather over the world-wide military supply lines and operations under the toughest conditions imaginable, has resulted in a finished product ready for commercial adaptation without time-consuming modifications usually required of virgin models. In addition, representatives of major U. S. airlines have contributed their technical knowledge and suggestions in preparing the wartime Commando for the medium-range peacetime airline traffic market.

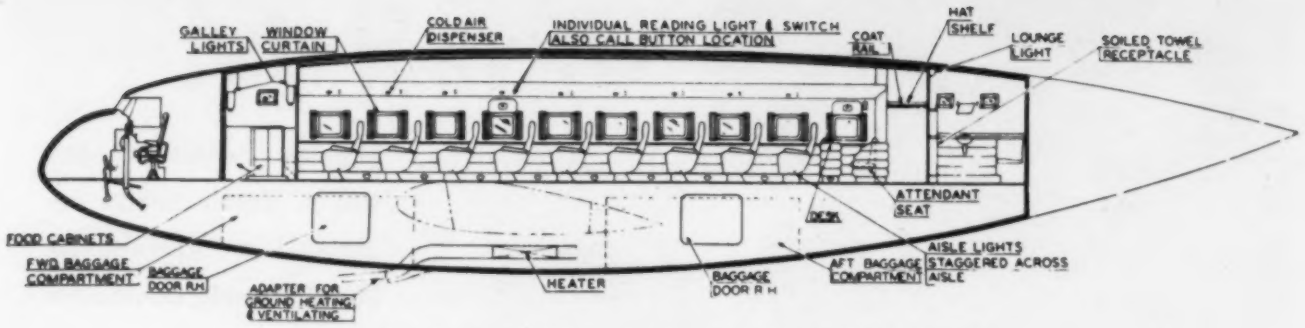
A recent Curtiss-Wright survey established the fact that 85 per cent of the airlines' business in the United States consists of trips not exceeding 600 miles. As the first of a series of transport and cargo airplanes to be produced by Curtiss-Wright, the Commando is designed to take off from and land on the average airport and has a maximum range of 1,520 miles.

Incorporates Changes, Innovations

Some of the features incorporated in the commercial version resulting from wartime operational experience are greater speed, increased gross weight and payload, all-welded, easily removable fuel tanks, improved flight control, major redesign of the nose and more powerful engines. Power is supplied by two Cyclone C18-B2 2,200-hp. engines which are also used on the Lockheed Constellation, the Boeing B-29 Superfortress and the Martin Mars. The powerful twin-row Cyclones drive three-way constant speed, full feathering Curtiss electric propellers, likewise tested on the rough-and-tumble war transport proving ground.

The Commando has "bird-proof" windshields, capable of withstanding the impact of birds in flight and recommended to all airplane builders by the CAA. Deep side-view windows increase the pilots' range of vision when landing, and defogging nozzles provide clear vision in wet or cold flying weather. The all-metal control surfaces are activated by aerodynamic

Simplicity features comfortable interior of CW-20E. Note roominess. Overhead racks are for parcels.



Side view drawing, showing under-floor cargo bins, redesigned nose.

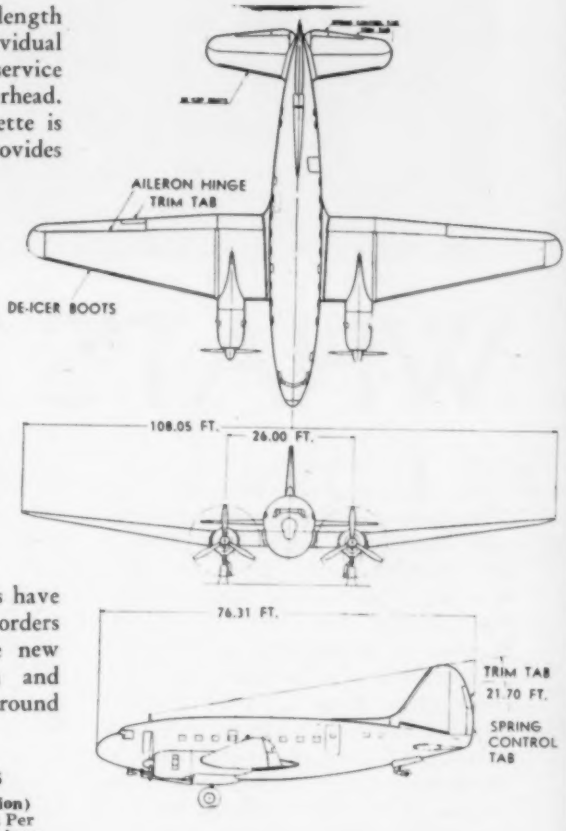
balance and spring tabs which replace hydraulic power boost. All controls are grouped forward so pilots do not have to reach backward for any controls. Every modern innovation has been applied to make the Commando an honest "pilot's airplane."

The cabin interior, interestingly enough, is not the product of the big name designers of the age; rather, it's the handiwork of the men and women of Curtiss-Wright. They challenged their management for the chance to plan, design and build the passengers' cabin—and their challenge was accepted. The full size mockup is testimony to the fact that the C-W "natives" are professionals. Drawing from the suggestions of veteran airline technicians, the Commando interior decorators have produced a pleasing, ultra-modern, comfortable and utilitarian passenger compartment well ahead of its time. Interchangeable chairs with fingertip control for reclining the back and sliding the seat forward will be appreciated by the most finicky air traveler. Wide windows afford an unobstructed panoramic view for the window-gazer. Each seat is equipped with an easily adjustable air vent which does not affect other passengers. Lavatory facilities are commodious with a men's room and a ladies' room provided. The double provision was made in anticipation of almost equal air travel by men and women. An indirect fluorescent lighting fixture runs the entire length of the cabin ceiling. An individual beam type reading light and service button are within easy reach overhead.

A "mechanized" sky kitchenette is finished in polished metal and provides a Dutch oven, grill hot plates, toaster, mixer and even a baby bottle warmer.

The Commando has more cargo space per passenger than any other transport airplane. Two large cargo compartments, one forward and one aft in the lower section of the fuselage, afford a total of 526 cubic feet of space for mail, luggage and express. Easily accessible from the ground, the compartments can accommodate full-size wardrobe trunks.

Two domestic airline operators have already announced placement of orders for substantial numbers of the new Commando transports—Eastern and National. Estimated price is around $300,000 each.



Direct Operating Costs

(Based on ATA Method of Computation)

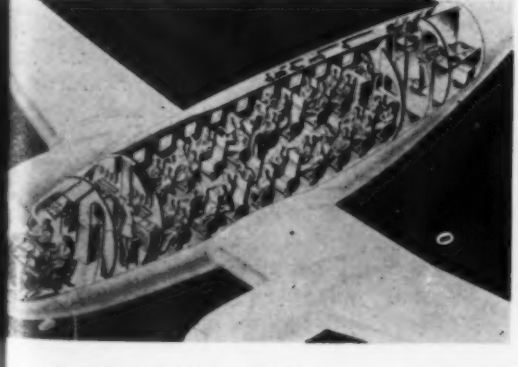
Trip Length	Block Speed	Payload	Cost Per Airplane Mile
100	175	10,854	.62
200	189	10,854	.57
300	198	10,600	.54
400	204	10,100	.52
500	208	9,600	.51
600	211	9,000	.50

Specifications

Curtiss Commando (Model CW-20E)

Passenger capacity	36 to 42
Normal take-off gross wt.	48,000 lbs.
Manufacturer's wt. empty	32,100 lbs.
Design useful load	15,900 lbs.
Wing Area	1,360 sq. ft.
Span	108 ft.
Length	76.31 ft.
Height	21.7 ft.
Maximum gross landing wt.	46,400 lbs.
Maximum payload	12,430 lbs.
Maximum Cruising Speed at 10,000 feet	242 mph.

Cutaway drawing illustrates crew quarters, kitchenette, lavatories as well as 36-passenger cabin.



On hand to greet the newsmen were C. W. France, vice president of Curtiss-Wright Corporation and general manager of the St. Louis plant; Burdette S. Wright, vice president of the airplane division; George A. Page, Jr., director of engineering, airplane division; Robert Earle, vice president in charge of the propeller division; W. L. Wells, chief engineer of the St. Louis plant; Ed Sulzman, sales manager, Wright Aeronautical Corporation division; Ken Boedecker, assistant to the general sales and service manager of Wright Aeronautical; J. N. Foster, factory manager of the St. Louis plant; and E. A. Warren, contracts manager.

Public relations personnel representing the company in the ceremonies included Jess Sweetser, Buell Patterson, A. D. Palmer, Jr., Ralph Swanson, Mark Nevils, John O'Connell, Mel Storz, E. H. Peach and R. W. Darrow.

Wartime finishes can prove costly when removed or rejuvenated. Here's timely advice for prospective purchasers of used airplanes.

By GEORGE E. WILSON
Sales Manager, Division of Aviation Finishes, The Glidden Company

WHAT'S THAT FINISH?

IN these days of "as is" selling, prospective purchasers of surplus or used airplanes should be very thorough in appraising their general condition. Too often the pre-purchase inspection is limited to a few inquiries about the number of hours on the engine since its last major overhaul, and a hurried and generalized check. Few of us could tell just by glancing over a used airplane that a recover and paint job would probably be needed to put it in top shape. Appearance alone is not always indicative of the actual condition of the airplane's fabric and finish. But, remember, recovering and painting will run from $350 to $550 on a two-place ship, and up to $1,400 or $1,500 on a four-place airplane, depending upon the quality of materials and finish.

This situation is due to wartime restrictions. A number of different aircraft finishes have been used on fabric-covered planes. While they may serve their original purpose well enough, they can be extremely troublesome and costly when it comes to refinishing. Among the finishes recently used are Cellulose Nitrate, Cellulose Acetate, Butyrate, and Synthetic Enamels as well as a combination type of Synthetic Lacquer. Some, such as the Cellulose Nitrate type, can be rejuvenated successfully if properly handled. Others, like the Synthetic Enamel type, cannot. Therefore, unless a complete recover job is contemplated, it is most important to determine just what type of finish is on the ship.

It is surprising to learn how finishing methods have had to be improvised. As materials became more difficult to obtain, this improvisation became more and more prevalent. The trouble was that the average paint shop was not well enough informed regarding the various types of finishes. On some planes, both Acetate and Nitrate dopes were applied, then the insignia and numbers were affixed with Synthetic Enamels. These heterogeneous applications worked all right for the time being, but, now that refinishing and rejuvenating time is approaching, they are developing into first-class headaches. Throughout the country, operators are trying to find some satisfactory method of removing insignia applied with ordinary household enamels.

Steps to Follow

There are ways, it is true. The first step is to determine what kind of finish is on the airplane, and the best way to do this is by chemical indicator. The following method is suggested to show the difference between Nitrate, Butyrate and Synthetic Resin Dopes:

Nitrate Dopes are best tested with a mixture of Diphenylamine and Sulphuric Acid. This colorless mixture will turn blue when applied to Nitrate Dopes.

Butyrate Dopes are soluble in Diethylene Chloride, while the other two are not.

Synthetic Resin Dopes are not as easily differentiated, but if a small amount is scraped into a test tube and heated, the fumes will crystallize on the side of the tube and thereby show up alkyd resin.

A number of various types of dope removers are on the market. Only the wax-free type should be used on fabric. For a satisfactory job, expert care and workmanship is required in using a wax-free dope remover, even when handled by an experienced craftsman. There is always the possibility of tearing the fabric or causing a "bagging" condition due to the softening of the clear dope and the stretching of the fabric. It is almost impossible to remove insignia from fabric covering without leaving ragged or rough edges. In a few cases, they have been removed by a very tedious sanding operation, but this involves many hours' work and of course is very expensive.

In countless instances, purchasers run into costly trouble that they did not anticipate solely because of their failure to inspect fabric and finish in the first place. For example, there was the case of a veteran operator purchasing a four-place job with the idea of putting it in shape and reselling it. First he washed it, cleaned the old finish well, and then gave it a light sanding before applying a coat of

(Continued on page 42)

FM Radio for Flying

Low price, light weight, and elimination of static are available from Frequency Modulation radio, which also will reduce antenna difficulties for pilots.

By KARL H. STELLO
Radio Engineer
Associate, Institute of Radio Engineers

FREQUENCY modulation (FM) appears to be the answer to the pilot's prayer—a distortion-free, static-free radio receiver and a transmitter with a good range that works well on a short antenna. The higher the altitude, the farther the signal is transmitted. It may no longer be necessary to have a trailing antenna, with wind socks that often come off and wire that twists and breaks.

The FM system eliminates nearly all interference, gives better operating economy and amazing fidelity of reproduction. You can literally hear a pin drop with FM radio. FM does away with ear-splitting summer static or the almost as bad winter "snow static." This is possible due to the fact that the FM channel width is wide enough to allow the passage of all audio frequencies up to 16,000 cycles per second, whereas in amplitude modulation, an audio frequency higher than 8,000 cycles per second cannot be transmitted without serious interference between stations. An improved signal to noise ratio is obtainable because static and interference are mostly an amplitude variation and not a frequency variation. FM systems have an advantage in discriminating against noise and interference due to the fact that an FM wave has the desirable characteristic of excluding all except the strongest signal.

The coverage of FM radio stations is substantially the same both day and night. Thus there is fade-free reception in FM and two bands for aircraft receivers would no longer be necessary. This would mean a saving in space and weight, which is always desirable in a plane.

For Better Signal, Just Climb

The physical size of an FM antenna is smaller in construction than the AM antenna due to the higher frequency. The amount of signal pickup in the FM antenna must be sufficiently high to insure complete limiter action, otherwise distortion and noise will result. Thus an antenna should be of sufficient length commensurate with the wave length to be sufficient. An antenna in the 50 megacycle region need be only about ten feet long. Since most interference from motor noise is horizontally polarized, it is desirable to have a vertically polarized receiving antenna to cancel out as much of this noise as possible. At the present, most of the experimental work on loop antennas is in connection with their use as highly directive transmitting antennas and loop antennas may prove most efficient and better suited for small planes.

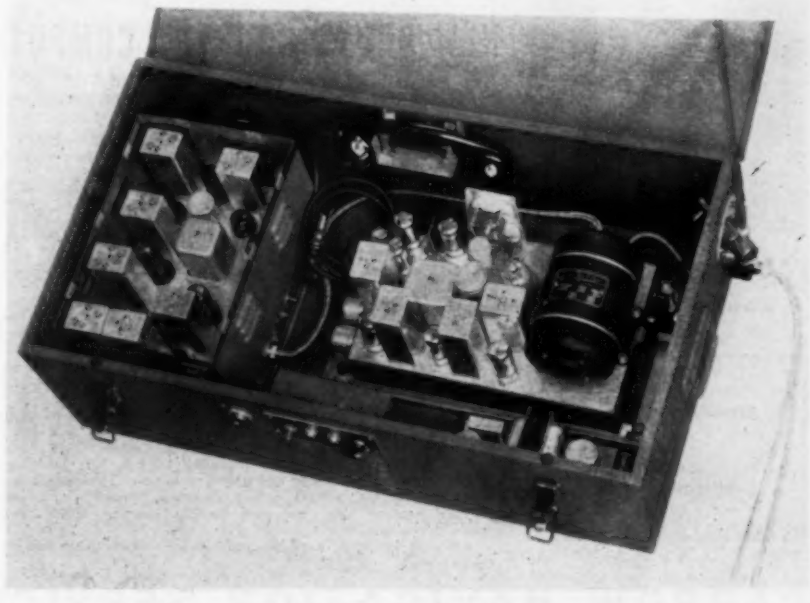
Doubling either the transmitting antenna height or the receiving antenna height increases the signal strength by 100 per cent. If you have an FM transmitter in your plane and cannot be heard while flying at 1,000 feet, then you could climb to 2,000 feet and thus double your signal strength.

FM radio has greater dependability of reception than amplitude modulation and where only speech and no music is transmitted, it is possible to limit the audio range from 500 to 3,000 cycles and also to employ a maximum deviation of only 15 K.C. This is possible in police radio, aviation radio and emergency services.

Cross Country Without Tuning

For an FM transmitter using the Armstrong system, the required multiplication is as low as thirty times and the band width would be reduced from 30 to 40 K.C. under these conditions. Multiplexing of two types of signals on one carrier is also a possibility with FM. Such a system would make possible the transmitting of two sound signals on the same carrier frequency to obtain binaural reproduction. This means that one sound channel could be placed on the carrier as FM and the other sound channel could be placed on the carrier as AM. However, the amount of amplitude modulation would be limited considerably below 100 per cent. Also, facsimile or the sending of printed words by radio can be multiplexed into the frequency modulated carrier for transmission of print and images along with sound and this fact has very definite possibilities for air navigation of the future. FM can also be used to provide the sound for television.

Thus weather information may be transmitted over the "on course" radio beam without a break in transmission and also printed information may be



Compactness is illustrated by this Link-type mobile two-way frequency modulation assembly, designed for emergency uses but readily adaptable to airplanes.
—(Fred M. Link Photo.)

received as a double check. It is possible that maps could be received while in flight, so flying will be simplified with FM radio and facsimile.

Since FM has in general definite limitations, it is probable that fewer frequencies will be necessary for aircraft radio and that many cities will use the same frequency. Thus, about midway between two airports, you would cease hearing one signal and begin to hear the call letters of the closer airport or the one with the stronger signal without changing the dial setting or touching the set.

The manufacture of new FM sets will provide employment for thousands and the sale of these receivers will help business, add to the pleasure of listening to good programs and give undistorted service for better radio communications in the air. FM equipment will be light enough to enable even the smallest plane owner to have two-way radio—a necessity for cross country and night flights. The price of prewar FM adapters for ordinary radio sets was only $49.95 and postwar combination AM-FM set should sell for as low as $100.

FM has a bright future in aviation and other services. It promises to open a new era in radio that will allow more frequencies to be available. Soon after victory various companies are expected to market new FM applications for broadcasting and other services such as aircraft and FM or "full measure" frequency modulation will go on to new horizons. ★ ★ ★

FOXHOLES SAVED 150 BOEING KAYDET TRAINERS at the Lodwick School of Aeronautics, Lakeland, Fla., during a recent hurricane. With wheels sunk in the soft sand off the runways and aprons, and 2x4 "spoilers" on the wings to break the airflow, the planes rode through gales up to ninety miles per hour during the night. —(E. F. Case Photo).

WHAT'S THAT FINISH?

(Continued from page 40)

rejuvenator. Then came the surprise —the last color coat of the old finish began to raise and wrinkle, a good indication that this last coat was Synthetic Enamel. His request for more of the Synthetic Enamel to finish the job had to be turned down because of government restrictions on certain raw materials. As an alternative, he was able to spray on two dry coats of pigmented dope with fairly satisfactory results. This was done by using a fast-drying reducer, increasing the pressure at the gun, and holding the spray quite a distance from the work. The result was a rather dry surface finish with no tendency to soak into the Synthetic Enamel.

Another operator found that the black numerals on the wings seemed to wrinkle and dry with a very rough finish when he sprayed coats of color-pigmented dopes over the old finish. This was another example of Synthetic Enamel having been used in numbering the ship. It is well to remember that while Synthetic Enamel can be applied over another coat satisfactorily, no rejuvenation of finish can be accomplished. Camouflage Dopes, Lacquers or Enamels have a tendency to become more brittle than the ordinary polishing dopes. Cellulose Nitrate Camouflage Dopes can be rejuvenated and repainted satisfactorily. The Acetate Butyrate types of Camouflage Dopes will not rejuvenate as satisfactorily as the Nitrate types.

In conclusion, if you are contemplating the purchase of a used airplane, inspect the finish and fabric very carefully. Remember that a recovering and painting job may add from $300 to $1,500 to the original purchase price. ★ ★ ★

Price $4.00 with complete illustrated instructions.

Attractive Discount

to

Legitimate Dealers

Announcing

NEW CROSS-COUNTRY COMPUTER

The X-C Computer is essentially a dead reckoning computer combined with a log sheet.

The following problems can be worked on the Computer:

1. Determination of Ground Speed being made good on a flight.
2. Flying time required to go a given distance, at a known speed.
3. Distance flown in a certain time, at a known speed.
4. Multiplication, division and proportion problems.
5. Fuel consumption problems.
6. Finding true air speed at different altitudes and temperatures.
7. Determination of true altitude above sea level.
8. Conversion of miles per hour to knots, or conversion of distance in statute miles to distance expressed in nautical miles.

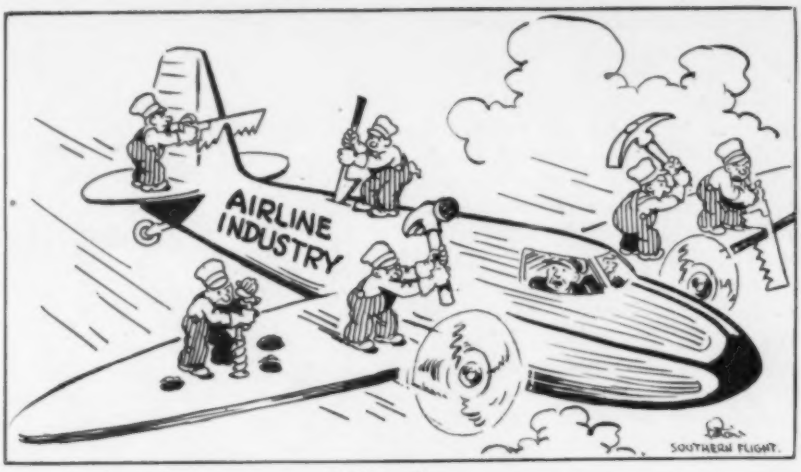
The log sheet portion of the X-C is designed primarily for the pilot, who must devote most of his attention to flying and who must keep his navigation log as simple as possible. The log sheet is for keeping in orderly fashion that data essential for cross-country navigation, so that it need not be committed to memory or scrawled illegibly on a chart.

It is not a substitute for plotting boards, but between the hand-held computer and the plotting board. It comes complete with leg straps, pencil holder, freeing the pilot's hands for 99 per cent of the time and having his log sheet available when he wants it.

All you need in a plane is the X-C Computer and a sectional map.

CARROW NAVIGATION SERVICE

2510 Oakdale, Houston 4, Texas



Gremlins

THE COMING *Railroad-Airlines* BATTLE

By SWANEE TAYLOR

PART III—CONCLUSION

Railroad exaggeration may have worked before, but this time public opinion will reject illogical claims. To see justice done, here's how you can serve.

WHEN the late Joseph B. Eastman was appointed Federal Co-ordinator of Transportation with the specific job of getting the railroads back on the track — they were in desperate financial straits — the country hoped that his office would bring about unity and the economy which meant survival of a sick industry.

Yet, in a report dated October 16, 1937, summarizing the first three years, we find that out of a total of 556 proposed co-ordinating projects, only twenty-four of the smaller ones were carried through. This becomes the more unbelievable when we learn that these twenty-four effected savings in the amount of $294,524 a year. Think what profits the stockholders might have had if those 556 suggestions had been put into practice.

So far sufficient evidence has been presented to remove any reasonable doubt as to the railroads' high culpability. Even one of the most forgiving nature must concede, by now, that as an industry it has a long, ruthless and cannibalistic history. However, there is still one revelation which cinches the railroads' guilt of treason against everything that is American. I quote from a letter from the general counsel of the Chicago, Milwaukee, St. Paul & Pacific R. R., written in 1934, to the president of that road:

"In pointing out the necessity of the arrangement he is suggesting, Judge Fletcher (then Chairman of the National Legislative Committee of the Association of Railroad Executives—Ed.) said that hearings before the committees *are largely matters of scenery to satisfy the public* and that the effective work cannot be accomplished in the appearance of members of his staff before committees."

This achieves a new, all-time high in contemptuousness.

Victory Impossible—But Still They Fight

The railroads have faced zero-zero prospects of success right from the start. And the reason why they could never hope to win lies in the fact that, like all usurpers since the dawn of history, they lacked the wit and wisdom to include in their reckoning the fact that peoples forever rise to strike off the yoke; be it religious, political, or economic. In a word, cynicism has yet to triumph over righteousness.

No, the railroads cannot win; they cannot hope to perpetrate the greedy Integration of Carriers scheme upon a people whose national character is built upon freedom from tyranny and feudalism.

In this instance our inspired champion is public opinion, which needs no coat of mail to turn the arrows of impiety. And it won't be much of a fight once Li'l David winds up his slingshot to let fly. Naturally, there can be no intimation of when and how the fight will begin. Battle plans are never published in advance, nor would any friend of aviation want the railroads to gain an inkling of the surprise or surprises in store for them. So, praise the Lord and pass Li'l David all the ammunition you can gather.

In the meantime, the Air Transport Association is rounding up some smooth, round stones of its own in the form of organized support. Woefully restricted as to funds, the ATA is doing a valiant job much to the dismay of the rail pressure boys. At the present writing its active supporters include:

(a) The Automobile Manufacturers Association, who have resolved, ". . . It is very doubtful that the public interest or that of transportation would be served by giving up a seasoned system of competition, which is virtually free from public complaint by substituting an entirely untried plan."

(b) The National Council of Private Motor Truck Owners, Inc., who say, ". . . that the Council oppose any of the so-called 'integration' plans and other plans looking to the curtailment or lessening in transportation and any proposals to prevent industry from using its own facilities to move its own goods."

(c) The Mississippi Valley Association (Water Carriers), ". . . We note, at this time, a resurgence of agitation . . . to permit railroads to operate all competing forms of transportation, including bus and truck lines, water transportation and airlines. We regard such an agitation as inviting a domes-

tic monopoly of transportation inimical to the public interest."

(d) The American Trucking Associations, Inc., " . . . resist encroachment by any form of transportation upon another and that the association support vigorously any legislation designed to prohibit such an encroachment."

(e) The Brotherhood of Railway Trainmen, who, of all groups, are downright militant against the proposed grab.

All of aviation, as is to be expected, lines up solidly against the rail carriers' ambush against the aviation industry. This stand is based on two uncommonly sound principles. First, a dread of the dire physical consequences which are sure to follow when inexperienced management undertakes air operations; secondly, the painful certainty of what would happen to American aeronautical development when and if it were absorbed by a competing transportation medium.

In the latter instance, rail control of air shipping and travel, we have but to dip into the bins of everyday experience for the answer. History is replete with cases of what happens when one industry envelops another. Quite naturally and normally the stronger of the two predominates, while the weaker is either neglected or, as often happens, is purposely choked to death. The railroads in the past have bought out literally hundreds of bus, truck and waterway competitors for the express purpose of eliminating them.

How You Can Help

As for the dread of catastrophic consequences in the event inexperienced management is allowed to assume aeronautical responsibility, this fear is based neither on surmise nor faintheartedness. You don't have to be an expert pilot to recognize the element of risk involved. Applied aviation is an intricate enterprise which has long since outgrown its monkey-wrench childhood and has attained the realm of adult engineering. This holds especially true in regard to airline operations, which itself represents the quintessence of refinement. It takes a long time to master the rudiments of any one of the jobs, each of which has direct bearing on human life and limb. No better proof of this can be found than in the fact that after more than two years' training and practice the Army Air Forces still depend largely on the contract carriers (airlines) to handle the job of worldwide air transportation. For that matter, both the Army and Navy Air Transport organizations are keyed by men commissioned straight from the airlines. Fortunately for our side, the Congress takes a sagacious view on air safety—a lot of them ride the airlines.

However, more help is needed to forestall the possibility of being crossed up by a crafty and conscienceless giant. Therefore every loyal friend of aviation will do well to hop to it and get in a lick or two for the cause. About the best thing you, as an individual, can do is to write letters to your legislators, state and national, as well as to the editor of your favorite newspaper. In this way you will gain the personal satisfaction of stymying the rail industry's aim at connivance. Only the big railroad systems favor the Integration of Carriers plans; the smaller ones stand to be gobbled up, too. The plea for "co-ordination" comes primarily from the railroads, an industry which

even at this late date has been a marked failure at getting itself reorganized on a sound basis; what price justice if the other carriers are called to account for the railroads' sins and mistakes. Our nation needs the world's best aviation facilities; not a single American must die again because of blindness to air power.

If enough true friends of aviation write enough letters, Li'l David is sure to knock the Integration of Carriers Goliath kicking with the first rock. ★ ★ ★

(EDITOR'S NOTE: *The author of this series of articles erred in the first installment (September issue) when reporting the vote of the U. S. Chamber of Commerce on the integration of carriers idea. Mr. Taylor reported,* . . . *"the ayes had it by a slight margin." The actual vote was 1526½ to 374½ for the resolution.)*

JUST AMONG OURSELVES

(Continued from page 6)

mission the ladies in the regular Army or disband them.

Miss Cochran probably wanted to be a Colonel, too. From all the evidence we gathered it appeared that her selfish ambition to be the gr-r-r-eat woman pilot of this war became an obsession to the extent that she could not face reality. She embarrassed the military leadership. She seemed to be interested solely in personal ambition and not in whether the services of the WASP were actually needed.

But no matter what side of the argument one took earlier this year during the stormy cat and dog fight which even reached the floors of Congress, every honest person must, in all fairness, pay high tribute to WASP. These hardy women pilots were accepted as volunteers during a time of male pilot shortage when Allied dominance over the skies of Europe was something yet to be attained. Approximately 1,000 of these women answered the call. They were trained by one of the outstanding flight contractors in the nation first at Houston, and later at Sweetwater, Texas. Thirty of them were killed while in the service of their country.

The women of the WASP deserve the highest tribute not only for their patriotism and their piloting ability, but for their excellent record. In this we confidently believe we express the majority attitude of those who were observers of the program, including the supernumerary male civilian pilots who understandingly yelled the loudest when Miss Cochran asked for WASP expansion while the males were being thrown out of flying jobs and drafted into the walking army. These men fought the program but never once did they sell the gals short.

Now that it's all over, the least the Air Forces could do would be the offer of a commission to those who might elect to remain in the war by joining the Air WAC even though they will not fly. The patriotic, capable women of the WASP deserve much more than a shoddy, printed certificate of service when they doff their "swoose" uniforms of blue next month and return to conventional female attire. ★ ★ ★

MODERN AIRPORTS

And Airport Management

NOVEMBER, 1944 • VOLUME I NUMBER 3

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Professional Engineers *for* Airport Designing

A Guest Editorial

By M. W. COCHRAN
Chief, Airport Section
Giffels & Vallet, Inc.
Detroit

IS there a practical way to develop adequate airport facilities without expanding a federal agency to perform detailed planning and engineering on thousands of airport projects throughout the United States?

CAA engineers, who have wrestled long and intelligently on airport development, deserve commendation for their part in expanding the airport program to meet military aviation requirements. Pressure due to political or military priorities of wartime demands did not permit the linking of peacetime airport needs with military airport requirements, and CAA airport engineers are not altogether satisfied with their progress in airport development for peacetime operation.

CONSEQUENTLY Congressman Jennings Randolph's bill, HR-5024, proposes to expand many times the CAA's airport engineering service, and allots for this purpose $5,000,000 annually, or 5 per cent of the bill's total federal appropriation requested for airport development over the next ten years.

It would seem that not more than $1,000,000 annually, or 1 per cent, would be sufficient to establish an airport service responsible for (1) general supervision of federal airport participation totalling $100,000,000 a year, (2) direction and co-ordination of research and development work to improve airport planning and design standards, and (3) development and integration of a national, state and city airport system.

EXPENDITURE of the funds requested in HR-5024 means that specific land areas, and perhaps some water areas, are to be improved in each of the forty-eight states; terminal buildings, runways, turfed areas, highways, and drainage structures are to be provided; airports must be planned and land acquired. To meet local problems of weather, terrain, and materials requires local experience at each site if the engineering is to be practical and the construction costs reasonable. Amortization of the investment should be in mind before expenditures are obligated.

In every state are professional engineers and architects now planning, designing, and engineering many types of construction projects similar to airports. It may be highly advisable to encourage these engineers and architects to become interested in airport planning and design of specific projects. It can well be that their participation now will warrant their continued activity in airport planning and engineering because of the economy in design and operation their training and experience can provide. Their environment is unrestricted; they can give adequate time to planning; they can conduct research for future needs while meeting needs of the present.

THE nation's private professional engineers and architects can provide adequate airport planning and engineering for the same dollars the CAA would spend. The savings in engineering, construction and obsolescence would be equal to at least double the engineering fees.

Direction of interstate air traffic is properly a federal function, but airport engineering problems are local to the site. The associated architects and engineers, along with thousands of their fellow-workers, are interested in the aviation industry's airport program. These same engineers turned in a commendable performance in planning and engineering the recent comprehensive wartime expansion program. Then is a national bureau the effective level for detailed planning and engineering on these thousands of airport projects in forty-eight states? ★ ★ ★

★ AIRPORT MERCHANDISING ★

By DUDLEY M. STEELE

CONVERTS are beginning to come in and the theory that an airport can be merchandised is slowly gaining ground. John F. Wilson, architect of Lexington, Kentucky, sent to us a set of plans showing a new administration building layout and asked for assistance, which was rendered them. They are planning a coffee shop on the ground floor and a second floor dining room, as well as telephone booths, cigar counter, and other methods of service to the public which will produce revenue to the terminal. Hart Bowman, Supervisor of Aviation of Dallas, is sending a floor plan of a new Dallas Air Terminal Building, and he says: "On the second floor will be our SkyRoom". More important, Bowman says: "Behind the cargo building about 300 feet will be the hotel building."

The theory regarding hotels at air terminals is taking shape. This writer predicts that hotels will be a profitable venture; will fill a long-felt need; and will operate at about 85 per cent capacity from the day they open their doors. It is not generally known but practically any large air terminal can use to great advantage a hotel and garage in which to house the cars of the patrons of that hotel as well as cars of airline travellers. This garage as a further service to the public should be in a position to sell gasoline and oil, lubrication jobs, various accessories, and take care of minor tune-ups. There is money in the garage business, and in a later column this writer will go more fully into the details of how these garages can be built without the necessity of using the city's funds.

Comes now our good friend, Kirk Baldwin, speaking at the Southeastern Regional Airport Management Conference held in Auburn, Alabama, 29-31, and confirming the thinking which this writer has been shouting from the housetops for some time. I quote a portion only of his talk:

"The major airport of the future is either going into the hotel business or the demand will be so great that individuals or corporations will build hotels or chains of hotels serving every major airport in the United States. There is hardly a large airport today that would not support a hotel. The best illustration of this is to consider what business could have been done by a hotel at your own airport during the past few years. It is true that circumstances have altered conditions and hotel accommodations everywhere have been taxed to capacity, but once private flying is resumed and civilians are permitted to use the airlines at their convenience, scores of people will be coming into the major airports daily who are potential hotel customers. Aeronautical exhibitions and aviation shows, drawing thousands of people to the airports over the week-ends, will bring in additional business.

"Flane crew members are always in need of rooms. Representatives from the airlines, manufacturers, oil companies and many others whose only business is at the airport are assured customers. Workers at the airport, private pilots and others who fly into the airport are prospective customers. The hotel business is certainly one of the most attractive investments to be made on the modern airport. At the smaller airports a moderate sized hotel or tourist camp is suggested.

"Just about as important as the hotel, is the modern garage. Here again, consider the business that could have been done in the past by a combination garage and filling station at your airport! The same will be true in the future. A garage for the storage of cars owned by the airlines' passengers, visitors to the airport, persons employed on the airport and others. It should be located close to the administration building for the convenience of airline passengers where their cars may be stored while on trips. Facilities should be provided in the garage for automobile repairs, washing and greasing. A public filling station should be operated in conjunction with the garage, and a drive-yourself system would pay dividends.

"There is hardly a business enterprise downtown that could not be operated at or near the airport. Bear in mind there is no intention of luring the merchants away from their present downtown locations, but during recent years there has been a decided tendency of establishing neighborhood shopping centers away from the congested business districts. The airport offers a splendid opportunity for a shopping center."

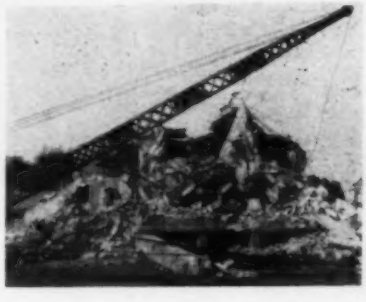
The writer strongly recommends that those who are interested in concrete ideas for revenue producing methods at airports write to: Robert G. Pitts, Alabama Polytechnic Institute, Auburn, Alabama, and obtain a copy of the Proceedings of The Southeastern Regional Airport Management Conference, with particular reference to the paper given by Kirk Baldwin of the Civil Aeronautics Administration. Kirk is an old time aviation enthusiast. He has an opportunity given to few people to travel widely throughout the United States and visit airports, discussing with airport managers and management how they obtain revenue from the public. Unquestionably his fund of information will be of extreme value when published.

There is one other phase in the development of revenue from the public, which Kirk Baldwin did not mention, but which I believe is worth noting. Many airports, built some years ago, were not designed with a view to accommodating facilities to serve the public, and by that is meant, space for dining rooms, coffee shops, gift shops, barber shops, newstands, areas where telephone booths, which are a source of considerable revenue, etc.,-can be located. A clever architect can take the space available, however, and with some ingenuity and initiative suggest alterations that will make it possible to develop many thousands of dollars of revenue without too much expense.

See you next month with more ideas. ★ ★ ★

PROGRESS!

America's most familiar airport hazard, the tall structure (above) obstructing Lambert Field's northwest runway at St. Louis in defiance of aviation efforts for years, has finally been removed (lower photo). It took AAF Midwestern Procurement District and $30,000 of St. Louis funds to do it.



Tennessee Bureau Leads the Way

By W. PERCY McDONALD
Chairman, Tennessee Bureau of Aeronautics

I HAVE been wondering how to explain an about face in my own thinking that has taken place in regard to one phase of aviation development. I have always been a firm believer in states rights. When I first read certain provisions of the Lea Bill, I was alarmed at what I interpreted to be an invasion of states rights. I now believe I was wrong.

I was wondering how to explain this change of opinion when I read that Mr. Patterson of the United Air Lines, recently said, "Current times and changing conditions prevent consistence." He was testifying at the CAB hearing where his prior testimony was evidently inconsistent with that he was then advocating.

A very careful analysis and study convinces me that air transportation is primarily a matter of national concern, should be entirely regulated by law, and regulations which are uniform throughout the country and that uniformity can only be had by national laws and regulations as distinguished from state laws and regulations.

I have had to overcome my own prejudices due to what I have many times thought were encroachments by the Federal government on states rights.

I was appearing before a certain public service commission objecting to their assuming jurisdiction of an intra-state air right application. I was interrupted by a member of the commission who said, "If you think we ain't got jurisdiction, you stay around about five minutes and we are going to show you." He then added, "We are going to take jurisdiction of anything that flies from point to point and we do not care even if it is a snow bird."

I have recited a true happening. Those of us who have followed the development of aviation regulation will recognize that different groups are proposing to set up rules regulating aviation that will not only be burdensome and expensive, but dangerous to air travel. While I believe there should be uniform safety regulations, I do not want to be understood as saying that a state department of aeronautics does not have a definite job to do. I believe that it has, and I think I can demonstrate to you that I am correct.

A person is to be excused if they talk about a thing they know best, and have worked closest with. At the same time I believe I can tell my story to you by reciting what we have done in Tennessee.

The Act of 1937 charges the Tennessee Bureau of Aeronautics with the duty of promoting aviation in the state of Tennessee.

We felt we should try to stimulate educational leaders, school administrators and teachers to the need of aviation education. We felt that aviation education was a public necessity,

Flight training and maintenance are two of numerous aviation educational courses provided through the Tennessee Bureau of Aeronautics. Top photo shows an instructor with a group of flight students discussing the traffic pattern at a Tennessee airport. In the lower photo students are studying the principles of engine operation.

Vision and Initiative Have Accomplished Great Strides in Tennessee Aeronautics. Here's How that Famous Bureau Has Functioned.

and with this in mind, the Tennessee Bureau of Aeronautics started introducing into our school system various types and forms of aviation education. This was done through the publication of textbooks and the distribution of model airplane kits, air maps, aviation bulletins, posters, pamphlets, booklets, and all types of propaganda that would direct the school youth of Tennessee. This was in 1937 and 1938.

During March of 1938, with the cooperation of the public school system of five major cities, five large ground schools were started, wherein ground subjects necessary in the requirements of the Federal government for pilot's license, were taken up. These schools were open to any citizen of the State of Tennessee who was over sixteen years of age. They were of the merit type. The fifteen students making the highest grades in each school received a scholarship that offered private instruction in piloting an airplane.

The Bureau consulted with the Civil Aeronautics Administration in Washington; with the Department of Engineering of the University of Tennessee; with the operations vice presidents of American Airlines, the United Air Lines, and the Chicago and Southern Airlines and, as a result, we are working on a plan to establish at the University of Tennessee an airport managers' school leading to a degree or certificate in Airport Management. The Bureau believes that many Tennesseeans who will be discharged from the armed forces will want to continue their life's work in aviation in one form or the other. From these veterans of World War II can come the students to fill this school at the University. It should amount to a rehabilitation program.

Results of Program

What are the tangible results of the aviation program in Tennessee?

We had nineteen airports in 1937 and we now have forty-two, exclusive of various military fields. The Army and Navy have recruited more air cadets in Tennessee than any other state in the Southeast territory. Tennessee has had more war training programs in its colleges than any other state. We originally had thirteen and now have twelve. I refer you to the following statistics of annual and faculty pay by the Federal government in Tennessee, in the operation of War Training Service: State Teacher's College, Johnson City, $75,000; College at Cookeville, $75,000; Knoxville (two colleges), $200,000; Chattanooga, $100,000; Martin, $75,000; Clarksville, $75,000; Nashville, $150,000; Murfreesboro, $75,000; Jackson, $75,000; Memphis, $50,000.

While we have been busy with our aviation educational work, we have not neglected our airports, or our Civil Air Patrol. The Bureau has acted as consultant to aviation vocational schools throughout the state.

W. Percy McDonald, chairman of the Tennessee Bureau of Aeronautics, has been active in aviation since World War I, organized the Memphis Aero Club in 1925, served on the Memphis Airport Commission throughout its existence, and has just been reappointed chairman of the Aviation Insurance Law Committee, Insurance Section, American Bar Association.
—(George W. Hayley Photo.)

The schools at Nashville, Memphis and Whitehaven, Tennessee, are outstanding in this connection.

The State of Tennessee's work in aviation education was recognized in November, 1943, at a meeting held at Nashville, Tennessee, with Dr. S. M. Vitalis, president of the National Research Council; Dr. Dean Brimhall, of the Civil Aeronautics Administration; Mrs. Phoebe Omlie, senior operating supervisor for the War Training Service Program; Dean Smith, of the University of Tennessee; and Governor Prentice Cooper met for the purpose of establishing a flying instructors Research Institute, at the University of Tennessee. At this meeting, the Tennessee Bureau of Aeronautics allocated $25,000 to the University of Tennessee, which was to be matched by $75,000 from the Civil Aeronautics Administration.

The Bureau has felt that aviation education, and flight training in colleges would make college airports desirable; with this in mind, Island Airport at Knoxville is now under lease to the University of Tennessee; the State Teachers College at Murfreesboro campus adjoins one of the best airports in the entire state; the University of Tennessee Junior College at Martin is directly connected with a fine airport, and substantial help has been given to the University of the South at Sewanee for their airfield, while the War Training Service Program is under way.

In February, 1942, the Tennessee Bureau of Aeronautics purchased a glider plane, and agreed to hire Harley Bowlus, of San Ferdo, California. He travelled to Tennessee to be the Director of the Tennessee Glider program. We wanted to set up a course of glider flying in our high school. Mr. Bowlus spent three weeks in Nashville outlining the course and preparing the applications. We sent our Executive Director to consult with Richard du Pont, of Wilmington, Delaware, as to the desirability of the program. He was the holder of all glider records in America, and approved the Bureau's program. The Bureau proposed to train twenty certified pilots, there being only 140 glider pilots in the United States at the time. But later the Bureau decided to cancel the glider program, regardless of the fact that the country around Sewanee and Winchester, Tennessee, is considered by glider experts to be one of the finest areas for sailplaning in the United States.

Women's Training Championed

The Bureau felt that aviation could be further promoted by the emphasizing of its importance through speakers, in the major cities of Tennessee. Through the co-operation of the Civil Aeronautics Administration and the United States Office of Education, and their joint aviation committees, we arranged for Dr. Dwyane Orton, Dr. Ben D. Wood, Congressman Jennings Randolph, Captain Gill Robb Wilson to make from one to four appearances before students, business men, and civic organizations in Knoxville, Nashville, Chattanooga, Memphis, Jackson, Clarksville, Columbia and Murfreesboro, Tennessee.

In November, 1942, the Bureau probably started its most colorful aviation educational project. We were advised by the Civil Aeronautics Administration that the Civilian Pilot Training Program did not include women, for the reason that funds were available only for training enlisted reservists. We believed that by a careful selection of personnel and properly supervised training that there was no reason why women could not be trained, so that they could be used in the training of pilots, both as ground and flight instructors.

We set up a training course for a group of ten girls, all of whom had many hours' flying experience. We then set up a twelve weeks' course, that when completed, they could not only teach flying, but ground school courses. These ten girls passed with good grades the required Civil Aeronautics Administration examination for instructors rating, and after they graduated they had the pick of offers of teaching in a dozen different schools. They are now teaching men to become pilots for the Army and Navy. These girls are employed from New Mexico to Georgia. Each instructor can teach fifty pilots each year.

Having demonstrated by this program that women could qualify, we then went to Washington and pre-

(Continued on page 74)

LOCAL FACILITIES *for National Progress*

Usefulness of Individual Airports Depends on Others Nearby. And Quality is Needed with Quantity.

By JOHN H. FREDERICK

AIRCRAFT, like ocean-going vessels, must make contact with solid earth at least at the beginning and end of their voyages. Every trip must commence and end at an airport or other ground space and it is only because we have such facilities that aircraft themselves exist. What we now call an airport has gone by many different names in aeronautical history; but whether we call it an airport, a flying field, an air base, an aerodrome, or give it some other name, it is the root of all aeronautical activity. Without airports of some sort, there could be no air transportation, no aircraft industry, no occasion for the development of the aeronautical arts and sciences. The better the airports, the greater the opportunity for the use of aircraft by everyone.

It is not only true that there can be no air transportation without airports, it is also true that no airport exists by itself. The usefulness of an individual airport depends on the status of other nearby airports, even those a hundred miles or more away. Airports depend on each other's existence and are greatly influenced by one another's quality. An isolated airport, with the operations of the aircraft located there restricted to brief local pleasure hops, to the training of students, and to a few specialized industrial uses would be almost as useless as a railroad terminal with no tracks. The first airport to be constructed in a great area heretofore closed to aircraft would be of almost no use. The construction of a second would enormously increase the value of the first; a third would similarly benefit the two previously existing; and so on. Though communities may be rivals in the attractions that their respective airports offer to air traffic, their common interest is far more important than their rivalry. Every user of aircraft, every community that has built an airport, and every commercial interest that has a stake in an airport have the best of reasons to become zealous partisans in the maintenance of a fully adequate system of airports serving every part of the nation. And beyond any local interest, the national interest in a free development of air commerce inevitably translates itself into an interest in airports.

While the Civil Aeronautics Authority classifies airports numerically; that is as class 1, 2, 3, 4, and 5 according to size and facilities provided, the average person thinks of them more along these lines: (1) Airports for commercial airline use. (2) Airports for non-scheduled flying.

There are two types of airports used by airlines today: (1) Where airline demands make only a relatively light load upon the airport's facilities, and spread over the twenty-four hours of each day. Airports having less than thirty scheduled arrivals and departures per day may be said to be in this group. (2) Where the airline load is heavy and continuous, with at least thirty and probably more scheduled arrivals and departures per day. There are, of course, many airports that now have substantially less than thirty schedules a day, but are likely to reach that figure within a short time, with its problems of intensive and congested operation.

Problems Vary

There are approximately 200 airports in this country used by the airlines. There will certainly be no fewer of these as time goes on; there will surely be more. It is estimated that nearly 3,000 airline stops will be necessary if all citizens are to have scheduled operations conveniently at hand. Certain requirements are characteristic of all airports to which a regularly scheduled service is to be efficiently rendered. There are other requirements found only at airports serving major traffic centers, usually at terminals or at the junction of two or more routes. Of the 200 cities now served, something more than half have no more than six scheduled arrivals per day and a like number of departures. For many of these cities it is unlikely that the total number of daily scheduled arrivals and departures will exceed a dozen for some years to come. At these airports airline traffic presents no threat of actual congestion of facilities.

There are, on the other hand, certain terminal airports that offer a very different problem. At those airports traffic congestion already exists and considerations of safety will demand that the immediate zones of landings and take-offs of airline operations be freed from the less-practiced and less-disciplined pilots and those receiving instruction. Even where there is no question of segregation of types of operation to avert dangerous congestion, there would still be other reasons for providing several airports for great metropolitan areas.

The difference between the major terminal, or junction point airports, and the intermediate stopping place for a few airline schedules is not limited to buildings and facilities for the landing areas. Undoubtedly the airlines will supply both express and local services along the main traveled airways. Planes for express service will undoubtedly require longer take-off and landing spaces than those which are entirely satisfactory for planes intended and constructed particularly for handling local traffic with frequent stops.

There are several types of airports primarily for non-scheduled flying. These are: (1) Airports not serving a major center of population, but which take care of scheduled as well as non-scheduled operation. (2) Airports serving a great metropolis which provide exclusively for non-scheduled flying so that it and the regular airlines may be freed from the danger of one another's interference. (3) General purpose airports for the communities having no scheduled operation. (4) Subsidiary airports or airparks scattered throughout the outlying portions of a large area of high population density. (5) Airparks located in recreational and other spots away from cities.

Facilities Determine Traffic

Under conditions that have existed during the past few years commercial air transport has been carried on regularly and faithfully under several handicaps imposed by the limitations of the typical airport. There are still a number of established airline stops not receiving service and in many of these the conditions at the local airports provide the chief explanation.

But beyond the difficulties of the localities that either have never had airline service or have temporarily lost it, there are a variety of special handicaps that affect the continuing air transport of other communities. In some cases the latest and most efficient types of planes, those that will be most favored by passengers, will not be able to be operated safely out of existing airports, and local service will have to be given with other type planes or not given at all. In other cases operations will be subject to the economic handicap of a limitation on maximum loading of the plane at its takeoff to substantially below what it would be allowed to carry on a field with more adequate runways. Some communities, although their airports will suffice through the greater part of the year, will find themselves deprived of service during periods of bad weather, especially during the snows of winter and the thaws of spring. Other airports, usable in good weather conditions, will be found unsatisfactory for instrument landings or even for visual approaches in bad weather until means have been found for removing some particularly unfavorable obstruction from the neighborhood or even from the airport itself or until the landing area itself has been enlarged.

The record of performance of American air transport has been admirable before and during the war, and its growth both in volume of operation and in public acceptance and popularity will be more rapid in the postwar years, but it can give a better, safer and more reliable service to more communities if the general quality and management standards of the airports used and to be used by the airlines, as regularly scheduled stopping places or as occasional alternatives, are kept to the highest standards. Likewise private flying cannot hope to develop without adequate airport facilities of the various types used by this division of aviation. Cities and towns without some sort of an airport will be like towns with no highways leading into or out of them. We are all at the bottom of the same air ocean but these ships of the air, large and small, commercial and private, must have a place to land. It all begins and ends with an airport. ★ ★

John M. Beardslee New CAA Chief in Hawaii

John M. Beardslee has been named manager of the Civil Aeronautics Administration's Ninth Region in Hawaii. Beardslee has been with the CAA since 1928, beginning as a civil engineer and assisting in laying out the beginnings of the airways system. Since then, he has had varied experience in many jobs within the CAA organization. For the past year he has been Chief of the Airways Engineering Branch of the Sixth Region with headquarters in California.

Here's One Airport Contract That Satisfies Both Parties

Once in a while a fixed-base operator and a municipality draw up an operating contract which both parties find reasonable and satisfactory. One of these is the contract now in force between "Buck" Frame, operator of Buck's Flight School, Lovell Field, Chattanooga, Tenn., and the City of Chattanooga. Describing its advantages, "Buck" comments:

"My reason for stating I was satisfied with this contract is the liberty the city is giving me in making improvements and operating as though it was my hangar. The contract clearly states the minimum and maximum rates on storage and leaves no doubt as to what I may expect in the way of maintenance from them. It also clearly states what is expected of me in the way of repairs, janitor service, etc."

For the assistance of operators or municipal officials who have found difficulty in drafting an adequate contract, the Chattanooga contract is quoted below:

THIS AGREEMENT entered into by and between the **CITY OF CHATTANOOGA, TENNESSEE**, a municipal corporation hereinafter referred to as "Lessor" and **S. A. FRAME**, operating under the trade name of **BUCK'S FLIGHT SCHOOL** of Chattanooga, Tennessee, hereinafter referred to as "Lessee".

WITNESSETH:

Lessor hereby lets unto Lessee the building known as the North Hangar located on Lovell Field, being an airport owned by Lessor. Said premises are to be used for the storage of aircraft, for the repair of aircraft, and for the sale of airplanes, airplane parts and accessories.

Lessee agrees that the minimum daily rate for small airplanes shall not be less than $1 per day, and the maximum rate shall not be more than $1.50 per day. The minimum monthly rate shall not be less than $10.00 and the maximum monthly rate not more than $12.50.

The minimum daily rate for medium size airplanes shall not be less than $1.50 and the maximum rate not more than $2.00 per day. The monthly rate shall not be less than $12.50, and the maximum rate not more than $20.00 per month.

The minimum daily rate for airline transport planes shall be not less than $2.00 per day, and the maximum rate not more than $3.50 per day.

Lessor agrees that Lessee may use the airport as a field school for the training of pilots.

Lessor agrees to furnish light, heat and water for the hangar.

Lessor reserves for its own use the boiler room and cold storage room on the East side of the hangar, to which it shall at all times have access.

Lessee agrees to operate said hangar and flight school in accordance with the rules and regulations promulgated by Lessor; Lessee's employes shall at all times obey the rules and regulations which have been or may hereafter be promulgated by Lessor, and comply with the instructions given by the airport manager.

Lessee shall keep the hangar in repair at his own expense, and shall operate same so that it will meet the requirements as to safety as promulgated by Lessor, the State of Tennessee or the Federal Government, and Lessee agrees that he and his employes will comply with all safety regulations that may be promulgated. Lessee and his employes agree to comply with all field rules regarding sanitation and fire prevention.

Lessee agrees to pay to Lessor a rental of $150.00 per month, in advance, beginning August 1st, 1944.

This lease is for a period of one (1) year from August 1st, 1944; Provided, that either party may terminate same upon giving the other thirty (30) days' written notice of an intention to terminate. Notice by Lessee shall be mailed to the Mayor of the City of Chattanooga, Tennessee, and notice given by Lessor shall be mailed to the Lessee.

Lessee agrees to so operate said hangar as not to increase the fire insurance rate thereon, and, in event the rates are increased because of such operation, Lessee shall pay to Lessor such amount as the rate may be increased.

Lessee agrees to hold Lessor harmless and to reimburse it for any damages it may be caused to pay because of the operation of the flight school.

If Lessee shall fail to operate and maintain said hangar in accordance with the rules and regulations promulgated by Lessor, or if Lessee and his employes shall fail to comply with the rules and regulations promulgated by the airport manager, then the Lessor, at its option, may cancel this lease upon giving ten (10) days' written notice of such intention to the Lessee.

Lessee agrees to return said hangar to Lessor at the expiration of this lease in as good order as received, ordinary wear and tear excepted, unless same be destroyed by fire not the fault of Lessee.

Lessee may place a sign on the front of the hangar showing his trade name and the uses to which the hangar is being put, said sign to meet the approval of the airport manager.

Lessee is given an option to renew this lease for an additional period of one (1) year, upon the same terms and conditions as herein contained.

EXECUTED in duplicate at Chattanooga, Tennessee, this 22nd day of July, 1944.

CITY OF CHATTANOOGA, TENNESSEE,
Lessor.
by (s) E. D. Bass, Mayor.

BUCK'S FLIGHT SCHOOL,
(s) S. A. Frame, Lessee.

EFFICIENCY AND PROTECTION in small multiple-plane hangar are represented by this structure at Joy Airport, Detroit School of Aviation, at Fraser, Michigan. Note bridge-type beams for adequate doorspan, all-metal construction, raised floor, ventilation and low roof.

Revenue vs. Costs AT HOUSTON MUNICIPAL

FOR the use of Houston Municipal Airport the airlines pay over half of the airport operating expenses. The airport shows for 1944 an estimated $6,611.86 gross profit on its operation without allowances for retirement of capital investment or interest on such investment.

The largest single expenditure on the Houston airport is for payroll totaling about 40 per cent. Maintenance is next in line at 35 per cent, then utilities at 20 per cent, and supplies of 5 per cent cover the balance of the cost items.

Revenue comes primarily from the airlines which contribute 45 per cent of the total. Fixed-base operators are second with 40 per cent, concessions are low at 8 per cent, and oil and gas sales franchises approximate 7 per cent.

The three airlines serving Houston are Eastern, Braniff, and Chicago and Southern. Fixed base operators located at the airport include Aviation Enterprises, Air Activities, and Russell Neil Aero Enterprise. Oil firms holding franchises are Gulf Oil Corporation, Humble Oil and Refining Company, Shell Oil Company, and the Texas Company.

Paul Koonce is airport manager.

WHO PAYS AT HOUSTON MUNICIPAL? (1944)

Airlines—		
Braniff Airways: Rent, $3,928.80; Landing Fees, $3,175.80		$ 7,104.60
Chicago and Southern Air Lines: Rent, $2,868; Landing fees, $1,875		4,743.00
Eastern Air Lines: Rent, $2,939.76; Landing fees, $4,612.50		7,552.26
		$19,399.86
Concessions—		
Coffee Shop, $1,805; Limousine Co., $326; Novelty counter, $580		2,711.00
Fixed Base Operators—		
Aviation Enterprises, Ltd., Air Activities, Russell Neil Aero Enterprise		17,537.00
Franchises—		
Oil companies and Operators		2,256.00
Other—		
Government offices, pay phones, etc.		1,284.00
		$43.187.00

$150,000 From Gas Concession Tops National's Revenue

A gross income of $516,470 for the twelve-month period ending June 30, 1944, has been reported for Washington National Airport, as compared with $443,901 for the previous twelve-month period. Revenues included: Gasoline concession, $150,000; rentals, $120,116; sales of food, tobacco, newspapers, etc., $90,968; restaurant, coffee shop and employes' cafeteria, $79,632; sales of utilities, $75,458; landing fees, $30,675; ramp service, $17,042; taxi and bus concessions, $15,850; charter and sight-seeing services, $2,000.

YEARLY EXPENSES Estimated 1944

Personal Services:			
Supervisory	$2,888		
Clerical	5,973		
Labor	5,825	$14,686	
Supplies:			
Office	192		
Mechanical and Electrical	845		
Automotive	170		
Cleaning and Sanitary	550		
Miscellaneous	88	1,845	
Contractual:			
Transportation	420		
Communication	1,260		
Light, Gas and Water	4,892		
Miscellaneous	288	6,860	
Maintenance:			
Lands and Buildings	9,023		
Instruments and Apparatus	169		
Machinery and Tools	67		
Repairs and Renewals electrical, etc.	3,676	$12,935	
Capital Outlay	250	250	
Total		$36,576	

AIRPORT CHARGES

Terminal Charges:

Rental—first floor—$2.00 per sq. ft. per year.

Rental—Mezzanine floor—$1.50 to $1.75 per sq. ft. per year.

Rental—second floor—Flat rate per month, to Weather Bureau and CAA. Radio to cover utilities, janitor service and toilet facilities.

Hangar Rentals:

Individual contract basis, flat rates, not based on square footage.

Landing Fees to Airlines Only:

Ships with capacity for 11 or more passengers:	
First Schedule*	$125.00
Second Schedule	75.00
Third Schedule	62.50
Fourth Schedule	50.00
Fifth Schedule	50.00
Sixth Schedule and each additional	35.00
Ships with capacity for 10 passengers:	
First Schedule	75.00
Second Schedule	50.00
Third and each additional Schedule (each)	40.00

Gasoline Franchises:

From 1c to 2c per gallon on gasoline delivered to airport, charged to delivering oil company or the receiving operator on the field per individual contracts.

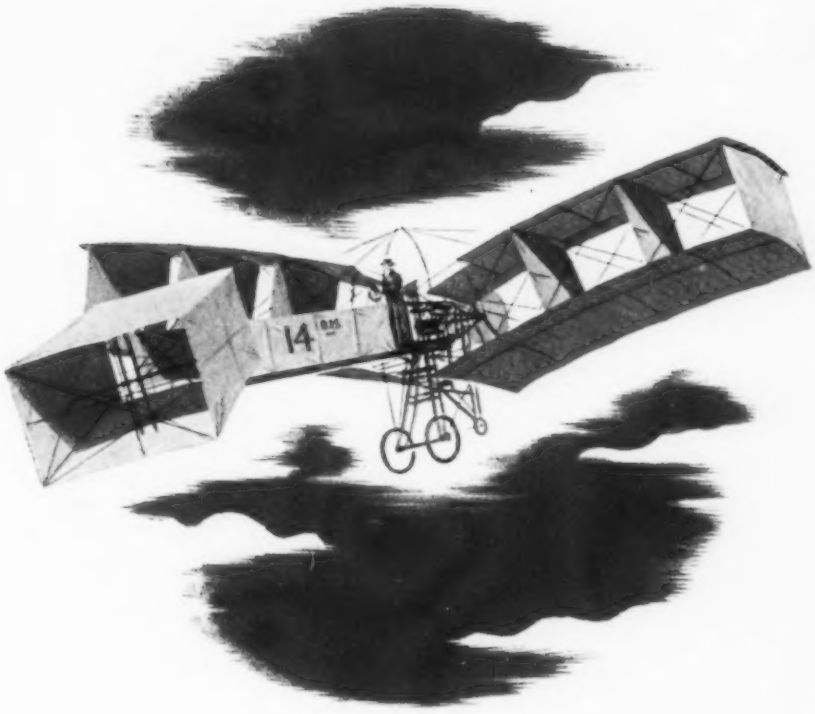
*"Schedule" meaning the landing and taking off of not more than one plane per day for a period of one month.

★ ★ ★

State Financing Asked for Illinois Airports

The Chicago Association of Commerce's board of directors has urged a new law that would enable Illinois to develop and aid in the financing of a statewide system of airports integrated with the national system. In addition, the board's resolution asked for the state to construct improvements on airports or airport sites which qualify under the statewide system; for state funds to drain, grade and pave runways, aprons and taxi-way; for beacon installations and other lighting; for the Illinois Aeronautics Commission to continue exercising the powers it now holds or which may be granted by the General Assembly; for all surveys, plans and specifications to be under the responsibility of the Department of Public Works.

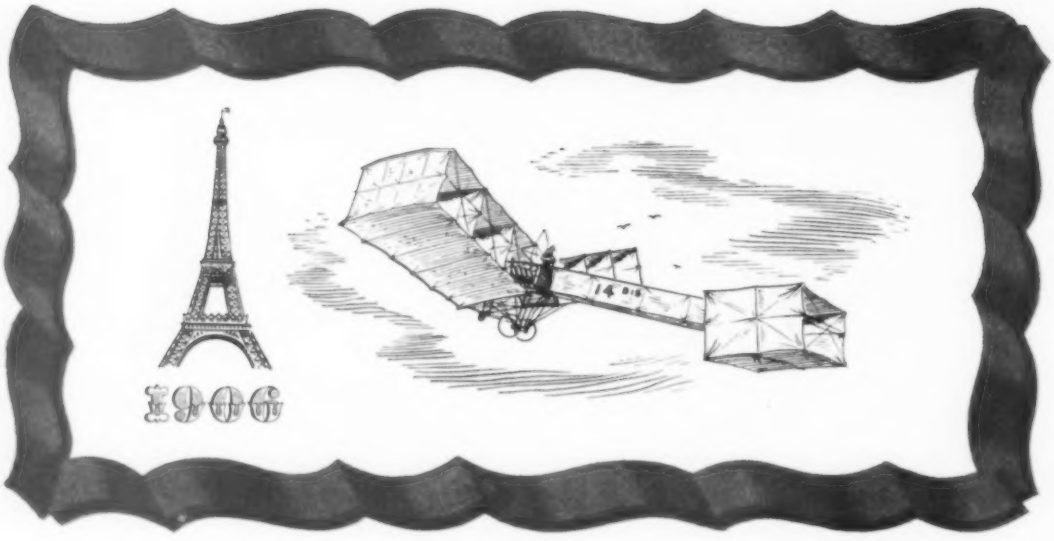
The special committee of the Association whose study provided the basis for the board's resolution was comprised of Paul H. Davis, chairman, James A. Cunningham, W. A. Patterson, Wade Fetzer, Jr., Russell B. James, P. W. Wilcox, Frank S. Whiting and Fletcher Lewis.



SETTING NEW STANDARDS IN AIR TRANSPORTATION

IN 1906, Santos-Dumont set new aircraft standards by flying 200 yards four times in a day, attaining a height of several feet and 23 m.p.h. without mishap.

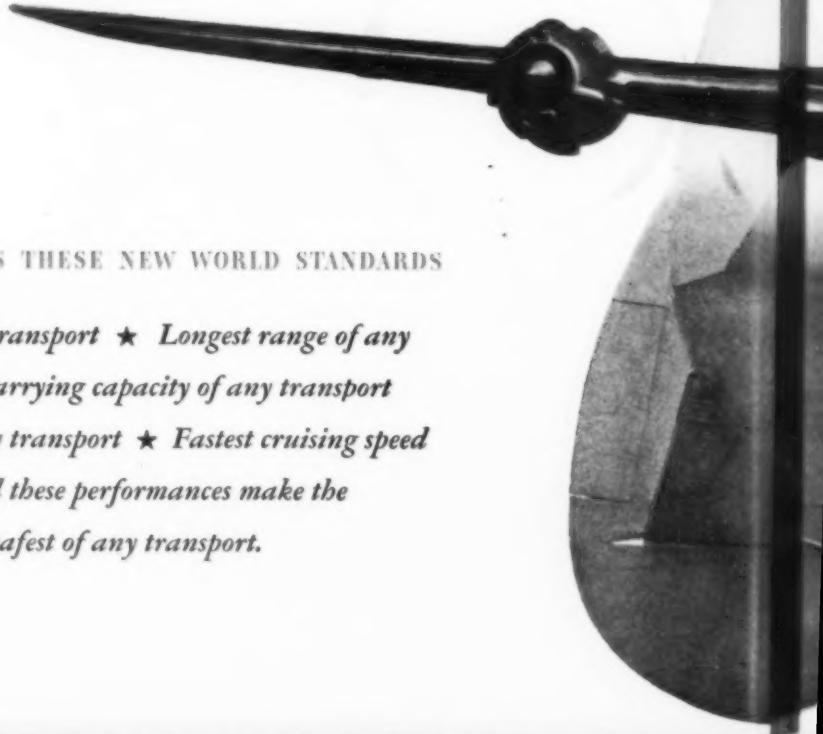
IN 1944, the powerful new Lockheed Constellation sets new world standards in air transportation, and is proved to be the largest, fastest, highest flying land transport ever built.



The Lockheed Constellation

HERITAGE OF PIONEERS — CHALLENGE TO TOMORROW

Santos-Dumont's gallant achievement was one of many. Year by year, since the turn of the century, longer, faster, higher flights are recorded in the history of aircraft. Today, with the performance of the Lockheed Constellation—setting new world standards in power, range, payload, and safety—the progress of flight has reached a new level. Despite its size, the Constellation easily takes off and lands on the average airport. Economywise, it surpasses the smaller transport—whether for over-ocean trips *or for flights as short as one hundred miles.* It commands the weather and terrain. It is the culmination of forty-one years of aircraft pioneering and a challenge to the designers and builders of tomorrow.



LOCKHEED LEADERSHIP SETS THESE NEW WORLD STANDARDS

Greatest rate of climb of any transport ★ Longest range of any transport ★ Biggest load-carrying capacity of any transport Highest cruising altitude of any transport ★ Fastest cruising speed of any transport ★ And these performances make the Constellation the safest of any transport.

310309

QUESTIONS

Q. Will the Constellation be an "expensive" plane to operate?
–W. T., Portsmouth, N. H.

A. *On the contrary. Cost per ton mile on flights from one hundred to three thousand miles is less than that of the transports in service today.*

Q. Is it true that the Constellation can carry 100 troops?
–Sergt. W. T. H., Fort Ord

A. *In its military version the Constellation can carry 100 troops and their equipment.*

Q. Why does the Constellation have three tails?
–Mary W., Atlanta

A. *Big rudder surfaces are needed to control big planes. By distributing the necessary 242 sq. ft. over three equal surfaces, plane is made safer and easier to handle in ordinary-sized hangars.*

Q. What are the Constellation's dimensions? –C.W.T., Chicago

A. *Wing span 123 ft., wing area 1650 sq. ft., length 95 ft., height 23 ft. 8 in., from ground to tip of the rudder.*

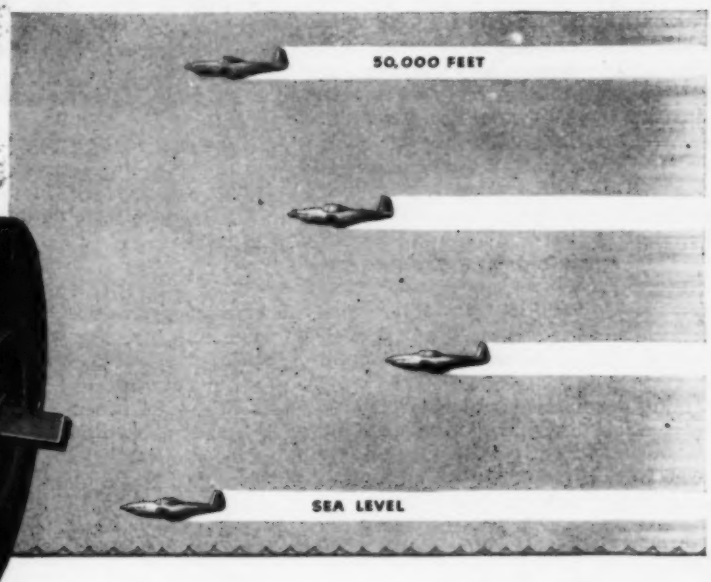
Send in your questions. Address: Lockheed Aircraft Corporation, Department 69-55, Burbank, California

LOCKHEED

FOR NEW WORLD STANDARDS IN AIR TRANSPORTATION

LOOK TO *Lockheed* FOR LEADERSHIP

New Hartwell bantam air compressor has been performance tested from sea level to 50,000 ft.



BANTAM AIR COMPRESSOR

Provides New Vacuum Source

The Hartwell bantam air compressor meets the need for a compact, lightweight vacuum source for aircraft. Designed to solve the problem of one of the nation's largest aircraft manufacturers, it is being enthusiastically received by all who have tested it.

Ready to install, the Hartwell bantam air compressor weighs 2½ pounds. Its overall height is 7 inches.

The new air compressor will operate efficiently in an inverted position—when it is engine-driven.

Here is a typical performance rating: Operating at 2,000 r.p.m., at an altitude of 30,000 feet, the Hartwell air compressor's output is 73 c.f.h. under a pressure of 9 lbs. p.s.i.

Performance tests from sea level to 50,000 feet have proved the stamina and dependability of this new lightweight air compressor. Made with a minimum number of parts, it is built to give long-term continuous service. All material, finishes and processes conform to or exceed applicable AN specifications.

For detailed engineering information write or wire our Los Angeles office.

Single source for 779 different aircraft production parts and tools

HARTWELL

AVIATION SUPPLY COMPANY

3417 Crenshaw Boulevard, Los Angeles 16, California

Dallas, Texas · Detroit, Mich. · Kansas City, Kansas

CONFERENCE SPURS GEORGIA ACTION

Plans for An Aviation Program, Including a State Commission, are Being Pushed in Georgia.

By MILTON F. BALDWIN

APPOINTMENT of an "action committee" to promote development of a state-wide aviation program was among the achievements recorded by the Georgia Aviation Clinic, which held sessions on October 3 and 4 at the Hotel Dempsey, Macon, with about 150 of Georgia's aviation leaders attending. Following the effective outlining of such a program by James V. Carmichael, member of the Georgia Aeronautics Advisory Board, the group appointed the following "action committee":

R. E. Allen, former mayor of Augusta; Noah E. Holton, Coffee County commissioner, Douglas; George C. Heyward, Savannah's Airport Commission chairman; Al B. Richardson, Aeronautical Training Society representative, Atlanta, and Charles L. Bowden, mayor of Macon.

Committee To Be Enlarged

This committee will increase its number by adding one or more members from each of Georgia's ten congressional districts, the ultimate membership probably totaling about a hundred. The committee will appear before the next session of the state general assembly to urge adoption of a farsighted aviation program for Georgia. One of its major recommendations provides creation of a permanent state aviation commission vested with proper authority and funds to serve its purposes effectively.

Georgia's Governor Ellis Arnall, a luncheon speaker, frankly invited the suggestions of aviation men toward action which would make their state an air leader, and promised that no barriers would be erected to oppose or hinder aviation. He favors state aviation taxes provided the revenue is spent for this industry's benefit.

Colonel Roscoe Turner advised municipal officials to make sure their airport planning was practical, and cited as a costly example a community of 7,500 population which is now building a $3,000,000 airport. "If the airport the Army has returned to your town is too large," he suggested, "use only part of it and let the rest go to weeds." And he concluded appropriately, "Let's analyze these matters; let's modernize our thinking!"

H. Harvie Perkins discussed acquisition of airports. The second region CAA airport supervisor placed responsibility for airport facilities on municipal officials, but suggested that representatives of each civic group should form the basis of an airport committee to co-operate closely with the officials in carrying out the program.

Twirling the crystal ball, Harvie brought forth these prognostications: Air passenger travel is expected to increase seven-fold between 1940 and 1950 but requires only about three times as many aircraft through greater capacities and fuller utilization. Within five years after war's end there will be a twenty-fold increase in number of civilian planes over 1940, totaling about 500,000 ships.

Jack Gray, dynamic manager of the Atlanta port for these many years, held his audience at close attention with practical answers to a list of potent airport questions he has faced. W. Percy McDonald's forceful summary of the Tennessee commission's achievements likewise evoked a cordial reception. Both of these important papers are published elsewhere in this issue.

Congressman Jennings Randolph, staunch proponent of aviation, was a banquet speaker. He foresaw many new companies entering the air transport picture, and cited Georgia's situation as an example. Of the forty-four companies making fifty-seven applications to provide service in that state, thirty-eight were new firms, he said.

Congressional Aviation Committees Urged

The congressman urged the necessity for a permanent standing aviation committee in both houses of Congress, to give this industry adequate representation. The committee now handling aviation matters has forty-two other subjects to consider, and aviation suffers. He also advocated flight training for 600,000 youngsters between seventeen and twenty-one, and urged that a fall range of preflight courses be offered by the nation's 28,000 high schools.

Practicability of feeder-line service was defended by Harry R. Stringer, vice president of All American Aviation, Inc. He contended that small communities would be given good service only by lines which relied on

AT THE GEORGIA AVIATION CLINIC: Ben T. Smith, vice president of Southeastern Air Service, Inc., and Cody Laird, president, confer with Wes Raymond, from whom Southeastern recently purchased the Raymond Aviation School of Macon and acquired his lease on the Herbert Smart airport. Georgia's Governor, Ellis Arnall (right), and H. Harvie Perkins, CAA Second Region supervisor of airports, examine the Clinic's photographic display. Congressman Jennings Randolph (left) and Charles H. Bowden, Macon's mayor, discuss the two-day program.

local business for their existence, and warned of a dim future for all air transportation if the railroads bring it under the control of their political lobbies at Washington. As an example of feeder-line potentialities he cited his company's air pickup lines, which in their sixth year of operation are now serving 118 communities ranging in population from 588 to 120,000.

Base your postwar civilian aviation program on projects already tested by the Civil Air Patrol, urged its national commander, Col. Earle L. Johnson, in an impressive message. He forcefully described the work of various units in stimulating local flying, building or acquiring airports, and laying the vital groundwork for early resumption of civilian flying.

J. Wendell Coombs, Aeronautical Training Society president, claimed that mass training alone would prevent our air force from becoming dangerously inadequate. He proposed flight training for college and university students, supplemented by mass instruction for a million or more youths between the ages of seventeen and twenty-three.

Maintenance Problems Rising

As the writer rode over to Macon with H. Harvie Perkins, popular second-region CAA supervisor of airports, we discussed the timely problem of huge multi-runway airports which the Army or Navy is handing back to small communities sufficiently courageous (or shortsighted) to accept. Harvie cited the case of a small town, under a thousand population, now saddled with a returned airport so vast the community cannot even afford to keep the grass cut.

It brought to mind the million-dollar military airport which was offered for a nearby town's sponsorship. The town officials gladly accepted it without seeking to define "sponsorship." Then the runway shoulders, relieved of all maintenance work, began to crumble. Today, says an authoritative report, that small community is in line for a federal lawsuit unless its white-elephant airport is put into good condition immediately. That's learning the hard way that maintenance and sponsorship can mean one and the same thing!

Not that the services or the federal government force these situations upon the communities. Many a time the town decides it wants a "ritzy" airport regardless of cost or the potential air traffic.

Right now there's a town floating a $350,000 bond issue for an airport. A well-known airport consultant was invited to the town to make a luncheon address on airports. Blissfully unaware of the impending bond issue, he gave the audience his honest opinion —that this town could profitably invest in a relatively small and unpretentious airport with proper provision for possible later expansion.

Then bedlam broke loose. The Chamber of Commerce, which was promoting the elaborate airport, demanded a retraction of his statements. The consultant received a deluge of telegrams and letters demanding that he clear up the "misimpression." That community evidently prefers to "splurge"—and let its children pay off the bonds!

The Georgia Aviation Clinic notably accomplished its purpose of organizing the state's aviation leaders in united action for air transportation's best interests. Mayor Bowden, his Aviation Committee, and the Macon Chamber of Commerce may well take a deep bow for their excellent work in setting the stage, with particular recognition for Lee S. Trimble, Chamber of Commerce vice president, whose constant alertness kept every feature of the Clinic moving smoothly and on schedule.

Situation at Random

As usual, "bull sessions" were a haphazard but invaluable feature of the Clinic. One of these days you'll be attending aviation meetings in which ably directed discussions—with every man allowed time to present his problems—will occupy as much time as the speeches, or even more.

The meeting over, six of us commandeered a taxi and headed for the Herbert Smart Airport, where the licensed brigand extorted six smackers for the trip. Tom Eve, Southern Airways' Charlotte manager and one of the party, will be quick to agree with Roy Rowe, North Carolina Aeronautics Commission chairman, who inquires pertinently in this same issue: "Will there be some sort of adequate shuttle service from town to airport, with reasonable rates and on definite schedules?" There had better be, if postwar aviation is to serve any but the plush-lined brackets.

Ike Jones, husky vice president of Southern Airways, flew me back to Atlanta with Mrs. Marguerite Bryan, of S. A.'s public relations staff. With a ten-mile tailwind added to the regular 145 mph. of his stable ship, we were seeking landing permission at Atlanta after only forty minutes' flight above pleasantly rolling hills and terraced farmland. Incidentally, Southern's offices at its recently dedicated hangar are now completed and provide excellent working facilities.

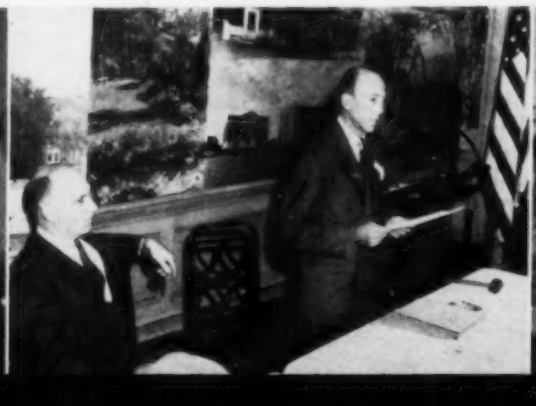
Had a stimulating visit with Lion G. Mason, alert head of the Aviation Supply Corporation, at his extensive store and offices adjoining the Atlanta Municipal Airport. The company is stepping ahead rapidly; its new Miami warehouse and the doubling of its Atlanta space are two recent evidences of its impressive growth. His comments on SOUTHERN FLIGHT make it seem clear that an aggressive editorial policy—with no punches pulled where southern aviation's interests are jeopardized—is worth all it may cost.

Atlanta's excellent airport, flanked by first-class permanent offices and hangars of prominent aviation concerns, is handicapped by a paradox: It has an airport hotel, but needs one. Probably one of these days this weak link will be voided by a new hotel which, in functional design, latest equipment, and up-to-date service, will satisfy the exacting demands of postwar air travelers.

Aboard Delta's night flight cruising homeward, I thought immediately of the shrewd merchandising theme stressed by Congressman Jennings Randolph with every aviation group he addresses: "Get your mayor, and your congressman, into the air!" He's right. Spend an hour and a little gasoline per day that way on your local aviation obstructionists — and watch their opposition melt into enthusiasm.

★ ★ ★

Roscoe Turner, former speed flier who delivered a forceful address before the Clinic, chats here with Charles O. McAfee (left), president of the Macon Chamber of Commerce, and Lee S. Trimble, its general manager. Bill Robertson, CAA regional manager, listens attentively as J. Wendell Coombs, Aeronautical Training Society head, discusses postwar aviation training. Carl Friedlander, vice president of Aeronca Aircraft Corporation, renews acquaintance with Captain William Offley, former Aeronca distributor, and Mrs. Offley.



Advisory board members for the Small Airport Planning Conference at Columbia, Mo., last month were (left to right), W. T. Piper manufacturer; Eugen V. Fryhoff, Missouri Department of Resources and Development; Roy M. Young, CAA; Guy A. Murray, CAA; Herbert Howell, CAA; John Wilson, National Aviation Trades Association; K. E. Van Scoy, Butler Manufacturing Co.; Paul V. Roberts, airport engineer, and Kenneth E. Newland, CAA.

Small Airport Needs

NATA Official Clarifies Position of Non-Scheduled Aviation at Missouri Conference.

CLARIFIED airport thinking by small-town airport planners — aided by less confusing guidance on the part of aviation experts — was the objective notably achieved by the Missouri Small Airport Planning Conference, which met at Columbia, October 10 and 11, with an attendance of close to 150. Its theme was ably outlined in the forceful address by John H. Wilson, executive director of the National Aviation Trades Association.

"We have marvelled," said Wilson, "at the nonchalance with which all of the so-called experts in aviation proceed to utterly confuse and mystify the small-town councilman or local representative in his airport thinking. . . . It is time we all stop selling ourselves and talk in kindergarten language to those in whose hands our future rests. We must tell them the alternatives open to them in making the decision regarding their landing facility, tell them the good and the bad and the whole truth, and say in effect: 'The decision is in your hands, and here are the facts on which to decide your course of action.'

Two Kinds of Aviation

"This landing facility for aircraft that we are talking about is simply an air harbor. It is a place where people who travel in the air ocean can enter your town, and as such has taken the common name of "airport."

People who use this air ocean do so because they save valuable time and multiply their usefulness by this method, and are therefore, generally speaking, the type you wish to have call on your community. They can reach you from any point in the world direct, and need no roads, rails, rivers or oceans — only a plot of ground properly prepared.

"Your own citizens also might want to use this means of transportation. It is still a baby, and the earlier the start, the sooner the benefits. Like your roads or harbors, it should be regarded as a public utility maintained as your town's invitation for tourist visitor or business prospect to stop. If you insist on making these people pay for the privilege of coming to see you, they will pass over and you will be the loser. If you insist that this landing area you provide must maintain itself, you surely hand the burden back to your callers sooner or later, and they are quick to realize this. Your local citizen and business man wants this facility also and is generally willing to bear the local expense if he can receive parallel treatment elsewhere. So you have decided on an airport? Then the decision must be made as to where to put it and the type it should be.

"Aviation operations can be divided roughly into two classes: Non-scheduled, which embraces a large number of the smaller types of aircraft carrying a few people in each unit, and scheduled aviation, which runs to large capacities and small number of units. There are about fourteen of the smaller ones for each of the larger, and the ratio in the future will probably remain about the same. Airplanes generally land one after another, on the longest strip provided, into the nearest wind direction. The non-scheduled part of aviation uses very little space, as the planes land slow and short. The long distances must be provided for the larger and faster scheduled part of flying. As to the volume of aircraft to be handled, you can land as many ships on a strip half a mile long as you can on one a mile long. The extra half mile accommodates the big fellow only. In order to get this length you generally have to have a lot more area. If you want to double the length, you must provide four times the area. This increase of four times will only accommodate about 7 per cent more airplanes, that is, only one in fifteen, the other fourteen can get along on the smaller area. The sad experience in the past has been that as the area was increased and the scheduled one moved in, the fourteen got in its way. Since the big ones were very much favored and subsidized, the fourteen moved out and had to go elsewhere. You are therefore faced with accommodating one phase or the other, the scheduled Big One or the non-scheduled Little Fourteen, or in providing different facilities for each.

Practical Planning Urged

"The airport for the Scheduled Big One must be built with expansion in mind. In order to secure the area it is almost always necessary to go out a considerable distance from town because land values immediately go up where airports are concerned and expansion is costly. Being far from town, the citizen-owner and small non-scheduled business is not handy to the home folks and suffers accordingly, but the scheduled portion can then carry persons and property in and out. You must realize that the policies of the CAA and their system of classification favors the scheduled phase of aviation and that their advice tends to sacrifice convenience for expansion. The class one will suit all of the needs of the non-scheduled Little Fourteen but when you expand it into the two-three-four-five, etc., it favors the Scheduled Big One and in line with government policy you will be advised to locate your airport to so expand. This one-two-three-four business is just a classification as to size, the higher the number the more super-duper. For all intents and purposes the No. One model fits the Non-Scheduled Fourteen and when located close to town and dolled up a little we call this an Air Park to differentiate it from the expanding thing. As to approval by CAA, they can't approve or disapprove any airport or Air Park which you build or use. Their approval is given when the subsidized and closely controlled airline wishes to stop at your town. This approval is for airline operation day or night

(Continued on page 68)

New

ROMEC

Water Injection Pump

with SUPERCHARGER

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INFORMATION, Please

By J. H. GRAY
Manager, Municipal Airport,
Atlanta, Georgia

Will an airport be self-sustaining?

The answer is very definitely NO, because the question usually emanates from a person thinking solely in terms of a cash register at the airport. But with a broader viewpoint of over-all benefit to the community as a whole — the answer is YES, with the important proviso that the airport must be adequately operated and maintained.

By way of discussion it might be said this question is asked more frequently than all others combined. To allow any community to believe each new airport will be a profitable enterprise from a standpoint of income and outgoing at the field, is to sell aviation short. It is much better if the residents of a community look upon an airport as an important and necessary public utility, so essential to the future growth and development of the community as to make its operations and maintenance worthy of their support as taxpayers. It is believed an airport should, for the purpose of comparison, be placed in the category of a private business enterprise, organized to serve a large area. Such a business is capitalized not merely to defray the cost of constructing the plant it occupies, but to provide an adequate inventory, to conduct a thorough advertising campaign, to defray all operating and administrative cost for so long a period of time as may be necessary to convince the buying public that it is worthy of patronage — in other words, long enough for goodwill to become a productive asset. The airport is a parallel case and it is believed any community which adequately capitalizes the maintenance and operation of an airport and makes community merchandising the primary objective of airport operation will inevitably find the airport will gradually grow into a self-sustaining enterprise, primarily because of the cultivation of goodwill on the part of the flying public. The size of the town is really of no great importance, for the communities grow in direct proportions to their transportation potentialities.

Should airports be publicly or privately owned?

This is a moot question, in that any answer is debatable. However, a defensible point of view is that with respect to the one-airport town, the airports should be public-owned since it can bring to bear so profound an influence on the future growth and development of the community. This is in contrast with private ownership for, however public-spirited the owners may be, they cannot avoid some of the selfish influences incidental to personal gain.

With respect to large communities capable of supporting two or more airports, it is believed that public ownership is desirable, if for no other reason than to control the location of airports. This will be true until such a time as locations can be controlled by zoning or some form of licensing. It would seem that a system of airports is intrinsically as much a part of transportation facilities of a metropolitan area as are its streets and boulevards, for both are designed to serve a multitude of private owners of various and sundry type of vehicles.

This is not the popular viewpoint in some circles at this time, but it is believed to be in keeping with sound community planning.

The case is somewhat analogous to that period in highway development when public officials were reluctant to ask the taxpayers to finance expensive bridges and costly sections of roads. Nevertheless, the bridges and roads were built by private capital and a toll was extracted from all who used them. It is a well known fact that the public was so much opposed to paying tolls that the system has in general been abolished throughout the United States and most such utilities are now under toll free public ownership. During the past years private capital has, in many localities, been willing to provide airport facilities when public officials would not. Today the attitude of private capital is unchanged and most public officials have made an "about-face" and now feel that airport ownership is largely a public responsibility which seems to fit in with the control of air traffic and the promotion of private aviation in an orderly manner somewhat more logically than does random and uncontrolled private ownership.

Should airports be publicly or privately operated?

Assuming the theory of public ownership to be sound, no particular objection is seen to private operations, provided the operator is bound by an equitable contract to operate the airport in the public interest and to include sound methods of community merchandising as a most important part of his operation policies, and, provided the governing body of the community recognizes its own obligations to the flying public and is willing to co-operate with the operator, financially if necessary, for a sufficient period of time to enable him to build up goodwill and insure that the airport can and will be operated at a profit both to himself and the community.

What structures should be set up within a community governing body for operating its airport?

The answer to this question is perhaps the most important key to suc-

Mid-way between El Paso and Phoenix is Arizona Airway's fine airport at Safford, elevation 2,906 feet. Here's a view with Cubs and a Navy Beechcraft on the line.

SOMETHING BIG— like lifting an ELEPHANT

A NEW, strange feature of the American Scene—those Flying Elephants in the neighborhood of vital war plants . . .

At night they are moored from ten to twelve thousand feet up—the better to clip your buzzard's wings, Tojo! With the mooring cable, a barrage balloon weighs about 1,350 pounds. It takes a lot of LIFT—12,000 cubic feet of HYDROGEN—to do this job!

Scientists at the "University of Petroleum," Shell's research laboratories, got hydrogen as a by-product when they discovered how to make smokeless powder components from petroleum gases—hydrogen to lift these flying Elephants!

Thus—one more outstanding contribution to America's war effort from Shell.

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Farsighted airport operators will find Shell's wartime popularity a profitable peacetime asset.

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FINER FUELS
FOR THE AGE OF FLIGHT

cessful airport operations, for certainly the responsibility for the inefficient operations of many airports can be traced directly to the City Hall, which has, in some instances, picked a political favorite and assigned him to a job for which he is totally incapable, or, if he is capable, is given to understand the City Hall was not interested and did not want to be bothered. He was given no financial help, in fact not even a sympathetic hearing. Then when the flying public complained, the poor fellow was kicked out and another political favorite appointed. Pretty soon there was an election which resulted in new faces at the City Hall and, of course, another airport manager, and so on and on.

In other instances the City Hall has singled out some commercial pilot with an airplane of doubtful airworthiness, told him to "take over" the airport, operate and maintain it. They hoped he would make a "go" of it. In most instances he had no capital, so the airport, the flying public and the community suffered, the latter all unknowingly. In a few instances he managed to make a going business out of the airport, only to have it taken away from him as soon as his success became apparent.

So much for a review of conditions and now for an answer to the question which is best given by citing two or three successful set-ups.

In Tulsa, Oklahoma, the airport is under the direct supervision of the Tulsa Park Board which consists of five business men. It was placed under the Park Board coincidentally with the voting of bonds for its construction, years ago. This Board is appointed by the City Commission and the term of appointment is five years. Original appointments were staggered, that is, one, two, three, four and five years. The Board has not changed since it was created, except for the Mayor, who is an ex-officio member. This Board appointed an airport manager and he is still airport manager today. He is paid an excellent salary; has complete authority over the airport and may even obligate funds whenever necessary. He signs checks for payment of city obligations. This airport is more than self-sustaining and has been for years.

Just recently the city of New Orleans voted five million dollars in bonds to construct buildings on the two airports recently completed by Civil Aeronautics Administration funds and in doing so, created a five-man board, known as the City of New Orleans Aviation Board, to construct, maintain and operate all New Orleans airports. Five outstanding business men were appointed to this Board for the terms of one, two, three, four and five years; subsequent appointments will be for five years. The Mayor is not an ex-officio member. This set-up will result in excellent operations of the New Orleans airports under a municipal director of airports who has already been selected by the Board.

Another instance, is the City of Ft. Smith, Arkansas, which created a three-man airport commission when voting airport bonds several years ago. The foregoing instances illustrate a very effective means of getting airport operations out of politics and it is believed everything possible should be done to encourage similar action on the part of all communities which expect to maintain and operate airports.

What type of individual should be selected as an airport manager?

This is an extremely important question and is best answered by enumerating the qualifications the airport manager should have in the order of their importance to the position:

a. He should be a good public relations man, which includes salesmanship ability, for his foremost objective is to merchandise his community to the flying public and to promote the patronage of airport concessions by local citizens.

b. He should have reasonable business administrative ability.

c. He should be conversant with aviation matters, though not necessarily a pilot. This qualification, while desirable, is not mandatory, since it should not take a capable person who spends the major part of his time around an airport long to absorb a broad conversational knowledge of aviation, particularly if he has the desire to do so.

What salary should an airport manager receive?

This question might well be answered by asking another: what salary should the sales manager of a business institution with a potential business outlook equal to that of the community in question receive? There isn't a dollar-and-cents answer to this question, but obviously the size of the salary should be enough to attract the most competent person available. After all, the annual salary paid to the airport manager, regardless of the amount, will be a mere pittance when comparing with the revenue brought into the community through the instrumentality of the airport if he does a good job of community merchandising.

What authority should be delegated to the airport manager?

He should have complete administrative authority over everything pertaining to the operation and maintenance of the airport including the authority to hire and fire all personnel employed by the airport and the authority to obligate funds accruing to the airport either from taxes or direct income. If he has been carefully selected, the airport manager's intimate knowledge of aviation problems will render him far more capable of assuming such a wide latitude of authority than anyone in the City Hall. If he is incapable of assuming such authority, he should be replaced, for the airport manager must have free use of his initiative if he is to keep his airport and his community in step with the anticipated progress of aviation.

Should the relationship between a community and its airport manager be on a contract basis?

By all means YES. A formal contract clearly defining the duties and responsibilities of the airport manager and of the governing body of the community should be executed. This contract should protect the airport manager against displacement because of changes in community administration officials to the fullest extent possible and should guarantee the community satisfactory performance on the part of the airport manager. The contract might well provide for a board of arbitration consisting of three persons, one selected by the manager, one by the community governing board, and one mutually agreeable to both, to settle any differences which may arise between the contracting parties.

What is the meaning of the term "non-exclusive" operation?

This simply means that no fixed-based operator or concessionaire is given the right to carry on his particular type of business without competition, but quite obviously there is no reason to assume he will not be permitted to do so as long as the volume of business is insufficient to justify the duplicate operation or he ceases to render service of uniform high quality. Certainly the community is deeply interested in seeing to it that the airport is successfully operated. To be successful, the operation must eventually be profitable at least to the operator, and by the same token, the community must retain the right to authorize duplicate operations and concessions if and when it becomes apparent that existing operations and concessions are for any reason no longer adequate to serve the public need.

Here again we see the need for an airport control board composed of business men to steer airport affairs rather than a political body.★ ★ ★

Simmonds Licensed by Dowty

Simmonds Aerocessories, Inc., New York, announces completion of arrangements, effective immediately, to serve as permanent representative and licensee in the U. S. for Dowty Equipment, Ltd., Cheltenham, England, developers and manufacturers of hydraulic pumps and equipment.

Simmonds is now manufacturing the Simmonds-Dowty Live-Line Pump, a radial, seven-cylinder, variable volume unit, incorporating an automatic pressure control device that maintains pressure in the hydraulic system with or without flow.

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AIRPORT EQUIPMENT

Tail Jack and Tow Bar Designed by Phillips

A tail jack, designed to lift a plane by the tail wheel when there is no other jacking point, has been made by Phillips Fump and Tank Company, Cincinnati, Ohio. The jack has an adjustable shoe on the elevator which

engages the tire for the lift. This jack can also be used in other servicing needs in the hangar by using other types of adapters on the elevator. The tail jack has maximum rise of seventy inches and lifting capacity of one ton.

A new tow bar made by the Phillips company is equipped with a collapsible truss which braces the bar when the plane is being towed around a turn. The tow bar has a universal link, making it attachable to one or more of several points on the plane.

Airport Construction Contracts are Placed

OAKLAND, CALIF. — Piazza & Huntley, San Jose, Calif., to construct taxiways at the Oakland Municipal Airport at an estimated cost of $140,497.

NEW YORK, N. Y.—Slattery Contracting Co., Inc., Woodside, L. I., N. Y., to construct additional parking apron for LaGuardia Field. The cost is estimated to be $14,294.

FARIS, IDAHO — Reynolds Construction Co., Springville, Utah, to construct drainage improvements at Bear Lake Co. Airport, near Paris, Idaho. The cost is $11,827.

GREENWOOD, MISS. — J. F. Thomason, Montgomery, Ala., to construct bituminous seal coat for pavement at the Greenwood Municipal Airport. The cost of work is $15,926.10.

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TRACTOR-POWERED CARGO LOADER developed by American Airlines facilitates handling of parcels but is also used as "escalator" for pilots in boarding plane, indicating future adaptation for loading passengers in larger super transports. Speed of conveyor belt, utilizing canvas-covered slats, is adjustable, and indicator on side establishes correct height for various planes.
—(American Airlines Photo.)

EQUIPMENT SERVICE

Readers desiring full details concerning Airport Equipment and Airport Literature are invited to address postcard requests to
MODERN AIRPORTS
P. O. Box 750, Dallas 1, Texas

Portable Beacons for Temporary Airports

A portable flashing beacon, using a gaseous-discharge lamp with power furnished by a portable gas engine, has been designed by General Electric engineers. It requires only one-third the power for that of a stationary airport rotating beacon, and weighs one-third as much. The portable beacon is mounted on a collapsible mast, producing a coded flash of such an intense brilliance that its exact candlepower cannot be measured. A choice of five codes is possible simply by rotating a selector built into the control unit.

New Program Timer Made by Zenith

Accuracy is stressed in the new Zenith Program Timer which gives signals at any five-minute period in a twenty-four-hour schedule, with circuit closure from five to sixty seconds. It is designed for factories, airports, schools and the like. The program mechanism is set automatically by turning the minute hand as on an ordinary clock; the schedule is easily changed any time without the use of tools.

Du Pont Explains About Ditch Dynamiting

"Ditching with Dynamite" is a new booklet by the Explosives Department of E. I. du Pont de Nemours & Co. It explains in detail, with illustrations, the technique of applying such product for ground use. It explains the two methods of blasting ditches: the propagation and the electric. The booklet explains that the propagation method can be used only in wet soils, while the electric method can be used in either wet or dry soils.

Instrument School Moves Into New Quarters

Classrooms, shops and laboratories of the American School of Aircraft Instruments has moved their quarters to 5245 W. San Fernando Road, Los Angeles, with Aero Technical Institute and other divisions of Aero-Crafts Corporation. This aircraft school now has increased facilities for practical training in buildings that are especially designed for such vocational study. The shops are divided into three classification: gyro, pressure and electrical instruments. Facilities are available for repair, assembly and testing of all types.

Information please . . .

at the

NATA

Convention . . .

Frankly, we expect to learn a lot at the N A T A Convention . . . and are looking forward with interest to hearing your ideas and plans for the future of our industry. Also, we hope to make a worthwhile contribution.

For 11 years we have been a source of supply for Aircraft Dealers. That's given us a lot of information which we'll be pleased to pass on. We're anxious to share our experience with you—to add what we have learned to your fund of knowledge—to consult with you on your own specific problems, and to submit workable, profit-making suggestions.

While at the Convention you are invited to visit the main office and warehouse of Supply Division, Inc., and see the complete stocks of aircraft hardware, parts and accessories that enable us to maintain our reputation for "same-day-service."

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YOUR *"Warehouse Annex"* FOR AERONAUTICAL SUPPLIES

Michigan Town with 4,000 People and 10 Personal Planes Claims Small-City Record

Last month's challenge by Orangeburg, S. C., on page forty-eight of MODERN AIRPORTS for October—claiming that this town of 12,000 has more personal planes based at its Jennings Airport than any other city of comparable size—has been called. Howell, Mich., only one-third the size of Orangeburg, claims the crown on a proportionate basis. But let the officials of Howell (pop. 4,000) City Airport present the evidence in their own words:

Field Rebuilt by Fliers

"The Orangeburg manager, Ralph C. Crocker, asked for comparisons from other airports of similar size. We feel that we have him beaten badly here in Howell, and here's how:

"On April 26, 1943, our complete airport installation, including all hangars and planes, was totally destroyed by cyclone. Since that time the former plane owners and pilots have completed the present facilities plus a three-plane hangar.

Our present inventory comprises:

"One three-plane hangar; one five-plane unit tee hangar with operations office and CAP headquarters; ten personal airplanes. Personnel is as follows: One flight instructor; five private pilots; thirty-one solo pilots; thirty-seven students; total, seventy-four pilots, all active."

If you think your airport shows a still better record, or if you have used certain operational methods which other airports could employ profitably, send MODERN AIRPORTS the information with a good picture. We'll be glad to publish the material and thus help other airport managers to profit.

Long Runways Need Marking for Lightplane Landings, Take-offs

Long runways should be marked off to show the safe take-off and landing points for various types of aircraft, according to Aero Insurance Underwriters. Since some airport runways have been lengthened by the military forces for large plane use, planes, as an unwritten law of safety, have been going the whole length of the runway. The smaller planes do not need a long runway to take off. Aero believes that there is an uneconomical amount of taxiing, wear and tear and loss of time for a small plane to use the length of a runway meant for a large bomber. In addition, the company says, it tends to overheat engines and create passenger discomfort. In some cases, the very long runways may have to be eliminated completely for economy of upkeep and maintenance.

Many Universities and Colleges Need Surplus Aviation Training Aids

Of 455 colleges and universities which replied to a questionnaire about teaching aviation subjects in the post-war period, 307 are definitely planning to offer aviation subjects and 237 are already teaching some aspects of the subject.

Ernest R. Breech, president of Bendix Aviation Corporation, which made the survey, used this information to point out a logical use for government-owned surplus aviation equipment. Of these schools, 160 have stated the necessity of acquiring teaching aids such as have been developed during the war, plus modern aircraft equipment, to bring their courses up to date.

In reply to the question "what can aviation do to assist you in establishing student interest in aviation?", 342 replied that the aircraft industry could aid by supplying schools with both equipment and information.

New Air Marking Bulletin Available

A new, revised Air Marking Bulletin, acceptable to the International Conference, is now ready for distribution and may be had free of charge by addressing Mrs. Blanche Noyes, Airways Engineering Division, CAA, Washington, D. C. The new manual will serve as a text book for air marking procedure throughout the globe when world-wide air travel is again possible.

The only change in the system from that originally devised by Mrs. Noyes is that latitude and longitude listings will be made in degrees and minutes. Previously the listings were in degrees and tenths of a degree. Thus the town of Ross, 4146, now is 41 degrees and 46 minutes north as against the old system of 41 degrees and 5 tenths north.

Otherwise the bulletin, Federal Airways Bulletin No. 12, remains the same. The types of markers are unchanged as are the dimensions of letters and numerals, quality of paint to be used, colors, etc. Communities, civic organizations and individuals desiring further information on putting up sky signboards will receive cordial assistance by addressing the Airways Engineering Division, mentioned above.

It is worthy of note that since the security ban against air marking has been lifted, a number of the states have indicated enthusiastic interest in having their communities properly air-marked as soon as possible. In many instances Civil Air Patrol organizations are leading the way, while local civic clubs have swamped Mrs. Noyes with requests as to how to mark their towns and cities.

In the South, Georgia, Mississippi and Florida, have yet to evince interest in this important phase of aviation. While in the East, New York and Rhode Island, are the two states which lag behind in the matter of helping citizen-fliers to keep from getting lost. The western states, for obvious reasons, will have to remain unmarked for some months yet.

SMALL AIRPORT NEEDS

(Continued from page 60)

and doesn't apply to the Non-Scheduled Fourteen, little people in the business. As to designation, this term is a wartime measure only, will be out soon and is mainly the problem of the operator on the airport. Let's forget this term, as it is temporary.

"So the problem to be solved or the decision to be made is whether your town shall build the close-in, non-expanding type of airport which will encourage local ownership and small business, which will handle as many units as any other, or go out quite a distance and build in the hope that in the future you will have airline service to your town, knowing that the investment is large and the possible gains will come in the future. In the small town the airpark type seems to be the sensible answer. In the medium town-city the airpark seems to be the sensible start, with reservation for a future far-out airline terminal at a later date. In the big city they already have the far-out airport, and must now satisfy the public by spending more money on close-in airparks, so they are reversing the normal process.

"We in the non-scheduled part of aviation believe that the class 1, close-in airpark will pay off to the community, to the returning veterans and to our future preparedness. It creates a large-volume market, a lot of little businesses, and big factories always ready for a war of the future. Small volumes of big airplanes cannot hope to do this job. Certainly the Airport Section of the CAA should tell the whole story, good and bad. They will not recommend government money except for the big—that is the policy to date. After the community gets the handout and the big field, it is then faced with maintaining it with little return. It is up to the CAA and all of us to tell all, and let the community decide the issue on its merits."

Eugen V. Fryhoff, Aviation Division, Missouri Department of Resources and Development, discussed the costs, financing, and acquiring of small airports. An excellent paper on types, locations, and uses of small airports was presented by Herbert Howell, Fifth Region CAA supervisor of airports. Other notable speakers on the program were Don Flower, sales manager of Cessna Aircraft Corporation, and Dr. James C. Miller, president of Christian College, Columbia. ★ ★ ★

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In the relative short period of fourteen years, Engineering Laboratories, Inc., has attained world-wide acceptance of basically new instruments. Many of these instruments and services are a result of our own engineering and development, while others are manufactured and sold under licenses from such outstanding companies as Socony-Vacuum Oil Company, Humble Oil Company, Phillips Petroleum Company, Barnsdall Oil Company, American Telephone & Telegraph Company, etc.

In an effort to give greater service to our old established world-wide clientele, we will act as distributors of associated aviation equipment of proven value and invite inquiries from reputable manufacturers who are desirous of increasing their distribution through facilities of Engineering Laboratories, Inc.

Harding Electric Fuel Shutoff Valve

E.L.I. **Inventions and developments for war, have solved problems previously considered insurmountable. To supply this equipment as well as quantity production of aircraft precision parts, equally vital to our armed forces, has necessitated great expansion of our facilities, made with our own capital.**

The forward march of E. L. I. research, design and manufacturing facilities have thus been greatly accelerated and already include many products of vital importance to post-war development, such as: Mass Spectrometer Computers, manufactured under license of Phillips Petroleum Company; 24 Trace Recording Oscillograph, making possible airfoil studies on aircraft simultaneously at 24 points; Phillips Detonation Meter for visual determination of knock point of aviation fuels; Harding Electric Magnetic Fuel Shutoff Valve, standard equipment on the Boeing Superfortress B-29's and B-32's and now in process of adaption to all commercial aircraft.

The customers of E. L. I. are the "Blue-Book" LEADERS throughout the United States and the World. In the post-war solution of scientific problems, Engineering Laboratories, Inc., offers its services on a very flexible basis as desired • Consulting • Engineering • Design and Development Work • Testing and Manufacture, or any part thereof. Customarily working on a cost-plus or contract basis at reasonable rates, we welcome your inquiries.

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Division of Operations from Management for Small Towns Urged at Southwestern Aviation Conference

Small town airports should divide operations from management if they want to serve the fixed-base operator and the community to best advantage. This was urged by Matt Ryan, manager of the Marshall, Minnesota, Municipal Airport in a talk highlighting the Southwestern Aviation Conference last month at Amarillo, Texas.

Ryan emphasized that small-town airport contracts should recognize the fundamental fact that fixed-base operators are primarily interested in operating the airport at a profit to themselves. The community should leave operations up to the operator, and maintain management either through an employed manager or an airport management committee of the town council.

"Draw your lease in such a manner," he recommended, "that the operator knows exactly what his privileges and responsibilities are, and be sure he understands the limits of his privileges. Generally, everything which produces revenue for the operator should produce some revenue for the city, directly or indirectly."

The Conference, sponsored by the Amarillo Chamber of Commerce with Rex B. Baxter in charge, was attended by over 350 persons from Texas, Oklahoma, New Mexico, and Colorado.

S. E. Travis, Jr., CAA Fourth Region supervisor of airports, recommended that planners should judge the size of a municipal airport by the "number of planes which can be handled between 4 and 6 p. m. on a busy Sunday"—not how many planes the hangar will hold. Joe Monroe, CAA airport supervisor from the Denver region, displayed charts outlining desirable airport layouts, and Carl Knupp, manager of English Field at Amarillo, surveyed practical methods for expanding airports. An aviation educational campaign was urged by Don Flower, Cessna Aircraft sales manager. Rear Admiral Charles E. Rosendahl compared the advantages of helium-filled lighter-than-air craft and expressed the hope that the large airship's place in U. S. aviation will soon be clarified.

Civilian Instruction Resumed at Tuscaloosa

Civilian student flight instruction has been resumed by the Alabama Institute of Aeronautics after filling a contract with the War Department to train French cadets. Students at the University of Alabama and citizens of Tuscaloosa, men and women alike, will be accepted as flying trainees. The original training program was started in 1939 with Oliver L. Parks, president of Parks Air College, handling the flight training part of one of the thirteen original quotas under the Civilian Pilot Training Program. AIA was the second of what eventually became five AAF primary training bases under the direction of Parks. The first was developed in connection with Parks Air College, which, however, kept its civilian status. The CPT activity near Tuscaloosa consisted of training American, British and, lastly, French cadets sent to this country to learn military air combat tactics. These contracts have been fulfilled, and the school will resume its aviation activities, offering refresher and special courses for students.

Shuttle Flying Service Established in Georgia

Columbus, Georgia, Airways, Inc., has been established for an all around flying service and proposed shuttle and passenger service for the Southeast. A "small city" investment of $135,000 has been raised. A group of sixteen Columbus business men have been granted a charter and are to confer with the Civil Aeronautics Board in Washington for passenger and air mail and freight privileges. Operations of the Airways will be from the $250,000 Muscogee County airport, and a nation-wide search has begun for qualified personnel. The use of local capital was commended by county officials, who cited the value of small shuttle companies operating over short routes and connecting the larger airlines.

Miami Aviation Country Club Solicits Membership

Membership invitations have been circulated by the Miami Aviation Country Club, on Biscayne Blvd. at 123rd St., Miami, Fla., "planned and designed to be a residential and recreational aviation center for member fliers and their families." The landing area of the club consists of two hard surfaced runways, 75 by 2,500 feet with grass landing strips of 200 by 2,500 feet on each side. These landing areas have been completed and are approved by the Civil Aeronautics Administration.

Complete plans also include a seaplane base, modern showrooms for manufacturers to display postwar planes, a modernly equipped restaurant, stores, shops, and an attractive clubhouse where sportsmen pilots from everywhere can get together in club atmosphere.

The Miami Aviation Country Club is a private organization.

Venezuela to Construct Six Modern Airports

Venezuela's program for future aviation development of international trade and travel includes the building of six modern new airports, according to Dr. Francisco Sucre, director of communications in the Venezuelan ministry of public works. Dr. Sucre attended the International Aviation Convention at Chicago last month. Two of the airports have already been constructed, one at San Antonio Tachira and the other at Barrancas.

San Francisco Chamber Adds Aviation Department

The San Francisco Chamber of Commerce has formed an Aviation Department as part of the Chamber's program to make the San Francisco Bay Area the passenger and freight air terminal of the West, Louis B. Lundborg, general manager of the Chamber, announced last month. Kenneth R. MacDonald will head this new department, which will co-ordinate the activities of the Bay Area Aviation Committee. The new Aviation Department is to deal with problems, plans and procedure relating to air transport of passengers, mail or cargo and private flying, schools and related activities for the Bay Area as a whole, including necessary airports and facilities for the air commerce of the future.

NAA Official Sees Airline Ownership of Terminals; Deplores Local Dependence on Government Help

The National Association of Commercial Organization Secretaries, meeting last month in Kansas City, was told by Glen B. Eastburn, manager of the Los Angeles Chamber of Commerce Transportation Department and vice president of the National Aeronautic Association, that "air transportation companies will own, individually or co-operatively, their own terminals within a few years or will regret they do not own them."

"Capital requirements, of course, are extremely large for a growing industry, but I do not accept the premise that commercial air terminals must be publicly owned," he said.

Eastburn, urging chambers of commerce to keep their "feet on the ground and not be stampeded by irresponsible promoters," listed seven important points as follows: (1) Let chambers cut out crystal gazing and get down to facts, (2) mobilize the economic data of the city for use in supporting aviation development, (3) find what commercial air service can be justified, (4) go after needed service with established or new operators, (5) determine the kind of facilities required for private flying, (6) know the laws, regulations and provisions of airport construction and flight operation, and (7) seek to keep alive individual initiative and private responsibility in aviation.

Deploring local dependence on government help, Eastburn said communities should explore the possibility of interesting local capital in construction of needed air terminals and airparks. "History is full of examples of enterprises, launched with government help, which lived to regret bureaucratic bondage that has stifled initiative and limited management's opportunity," he said.

Picture of Republic Employees massed to honor a returning Thunderbolt ace . . .

10,000 THUNDERBOLTS!

The 10,000th Republic Thunderbolt is on its way to the fighting front. On the day it came off the assembly lines, there was a moment's pause for the "christening," a hearty cheer, and the line started moving again. A small incident, perhaps, in a world at war . . . but a significant one.

Created to do things no airplane had ever done before, the Thunderbolt has helped our Air Forces solve one tactical problem after another . . . from long distance bomber escort to dive-bombing and ground strafing. Today, bearing the colors of five United Nations, the Thunderbolt fights on every front and from the remotest outposts.

The Thunderbolt is a complex machine, heavily armed and armored, superpowered, highly supercharged. It weighs more than eight tons. It costs $100,000. It takes 20,000 man-hours to build. It was created and produced in record time in record quantities—10,000 in 27 months—not by a "miracle" but through typical American ingenuity, downright hard work and splendid coöperation by thousands of people—civilian and military.

Republic is proud, naturally, of the technical excellence of the Thunderbolt, of its production record, and of the superlative battle record of the pilots in whose hands it springs to life as a weapon of war.

WRITE THAT BOY TODAY . . . V-MAIL

But Republic is prouder still of the spirit of those Americans who joined hands and brains to build it, and who today press on to new thousands of Thunderbolts . . . and Victory!

Republic Aviation Corporation, Farmingdale, Long Island, New York, and Evansville, Indiana.

Republic *firsts* in war point to *firsts* in peace

REPUBLIC AVIATION
CORPORATION
Specialists in High-speed, High-altitude Aircraft

Designated Landing Area Supplements

Additions and changes by the Civil Aeronautics Authority issued during September and on October 12 in the form of supplements to "Designated Landing Areas" of July 25, 1944, were as follows:

(Legend: (DL)—days only, (VC)—field in vital defense area which has been given a channel or channels, leading out of the area, by the Fighter Command and approved by the Interdepartmental Air Traffic Control Board):

Additional Designated Landing Areas

ARKANSAS—Clarksville — Clarksville Airport (DL). Dewitt—Smith Field (DL).

CALIFORNIA—Los Angeles (Culver City)—Culver City Airport (DL) (V). Pomona—Pomona Airport (DL) (V). San Mateo—San Mateo Airport (DL) (V).

COLORADO—Denver—Ruston Field (DL). Granby—Granby Airport (DL). Hugo—Hugo Airport (DL). Julesburg—Doughty Airport (DL). Rifle—Rifle Airport (DL). Trinidad—Trinidad Airport (DL).

CONNECTICUT—Monroe—Monroe Airport (DL) (VC)—3 mi. wide channel extends to boundary of Vital Defense Area, and aligned on Wingdale Airport, Wingdale, N. Y.

FLORIDA—Avon Park—Avon Park Airport (DL). Quincy—Quincy Airport (DL).

GEORGIA—Darien — Darien Airport (DL).

IDAHO—Montpelier — Montpelier Airport (DL). Preston—Preston Airport (DL).

ILLINOIS—Alexander — Negus Field (DL). Carthage—Carthage Airport (DL). Du Quoin—Du Quoin Airport (DL). Marion—Marion Airport (DL). Pecatonica—Pecatonica Airport (DL). Streator—Streator Airport (DL).

INDIANA—Bedford—Bedford Airport (DL). Greenfield—Greenfield Airport (DL). Huntington — Huntington Airport. CAA Int. Field (DL). Perrysville—Highland Park Airport (DL). Richmond—East Richmond Airport (DL).

IOWA—Perry—Adamson Airways Airport (DL).

KANSAS—Herington — Herington Airport (DL). Iola—Iola Airport (DL).

KENTUCKY—Milford — Milford Airport (DL). Paducah—Howell Field (DL).

MAINE—Portage Lake—Portage Lake Seaplane Base (DL).

MARYLAND—College Park—College Park Airport (DL) (VC)—2 mi. wide channel extends from this airport along St. 193 to Wheaton, Md.; thence along St. 586 to Congressional Airport, Rockville, Md.; thence along existing channel centered on US 240 to boundary of Vital Defense Area. Greenbelt—Schrom Airport (DL). Hyattsville—Queens Chapel Airport (DL).

MASSACHUSETTS—North Adams—Stevens Field (DL). Orange—Orange Airport (DL). Worcester—Leicester Airport (DL).

MICHIGAN — Davidson — Seely's Airport (DL). Garden City—Smith Field (DL). Ithaca—Johnson's Airport (DL). Mason—Jewett Airport (DL). Milan—Milan Airport (DL). Muskegon—Northside Airport (DL).

MINNESOTA—Detroit Lakes—Detroit Lakes Airport (DL).

MISSISSIPPI—Jackson—East Jackson Airport (DL).

MISSOURI—Sedalia—Sedalia Airport (DL). Unionville—Unionville Airways Airport (DL).

MONTANA—Glendive — Glendive Airport (DL).

NEBRASKA—Ainsworth—Ainsworth Airport (DL). Hay Springs—Hay Springs Airport (DL). Hebron—Hebron Airport (DL). Kearney—Birdsall Airport (DL).

NEW HAMPSHIRE—Wolfeboro—Lakes Region Flying Service (DL).

NEW JERSEY—Hackettstown — Hackettstown Airport (DL).

NEW MEXICO—Alamogordo — Alamogordo Airport (DL). Carlsbad—Tracy Field (DL). Tucumcari—Tucumcari Airport (DL).

NEW YORK—Batavia — Batavia Airport (DL). Blasdell—Lakeview Airport (DL). Hammondsport — Mercury Field (DL). Lake George—Hall's Seaplane Base (DL). Mexico—Ladd's Field (DL). Salamanca—Salamanca Airport (DL). South Cairo—Catskill Airport (DL). Syracuse—Onondaga Lake Seaplane Base (DL).

NORTH CAROLINA — Rockingham-Hamlet—Rockingham-Hamlet Airport (DL). Selma—Selma Airport (DL).

OHIO—Bedford—Ward Airport (DL). Conneaut—Conneaut Airport (DL). Kenton—Cedar Lawn Airport (DL). New Holland—Tri-County Airport (DL). Norwalk—Norwalk Airport (DL). Paulding—Paulding Airport (DL). Tiffin—Tiffin University Airport (DL). Willard—Willard Airport (DL).

OKLAHOMA—Wewoka — Wewoka Airport (DL).

OREGON—Wasco—Wasco Airport (DL). Worden—CAP Airport (DL).

PENNSYLVANIA—Carlisle—Carlisle Airport (DL). Collegeville—Perkiomen Valley Airport (DL). Duncansville—Altoona Airport (DL). Harrisburg—Harrisburg Seaplane Anchorage (DL). Honey Brook—Honey Brook Airport (DL). Kane—Kane Airport (DL). Philadelphia—Somerton Airport (DL). Salix—Salix Airport (DL).

SOUTH CAROLINA — Charleston — Clark Field (DL).

SOUTH DAKOTA—Edgemont — Edgemont Airport (DL).

TEXAS—Del Rio—Del Rio Airport (DL). Red Bluff Lake—Hines Airport (DL). Casper—Wardwell Field (DL).

VERMONT—Swanton — Missisquoi Airport (DL).

VIRGINIA — Lawrenceville — Lawrenceville Airport, CAA Int. Field (DL). Leesburg—Washington Flying Services Airport (DL).

WASHINGTON — Kent — Valley Airport (DL).

WISCONSIN—Fond du Lac—Fond du Lac Airport (DL). Land o' Lakes—King's Gateway Airport (DL). Marshfield—Marshfield Airport (DL). Milwaukee—Sky Haven Airport (DL).

Cancelled Designated Landing Areas

ALABAMA—Tuscaloosa—Foster Field.

KANSAS—Emporia—Emporia Airport.

NEBRASKA—Lincoln—White & Jensen Airport.

NEVADA—Yerington—Yerington Air School.

NEW HAMPSHIRE—Newport—Albert N. Parlin Field.

NEW JERSEY—Linden—General Motors, Linden Airport.

NEW YORK—Montgomery—Tri-States Airport.

OKLAHOMA—Chickasha—Lowell Airport.

TEXAS—Cuero—Cuero Airport.

VERMONT—St. Johnsbury—Brown Field.

Designation Changes

ARIZONA—Phoenix—Sky Harbor Airport. Will hereafter be designated for twenty-four-hour operation.

OREGON—Ontario—Ontario Airport. Will hereafter be designated for twenty-four-hour operation.

WASHINGTON — Kent — Valley Airport (DL). Located in Vital Defense Area.

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Detroit Invites Firms to Bid for $80,000 Master Plan Analysis

The Michigan Board of Aeronautics has set aside $80,000 for airport planning in southeastern Michigan and to employ a competent firm to make an analysis and master plan in the near future. Any surplus is to be used for planning specific airport locations.

In the program, the Board has joined with the city and county officials of Detroit, Wayne, Oakland and Macomb Counties to form the "Detroit Metropolitan Aviation Planning Authority." It will study existing and proposed facilities for scheduled and non-scheduled aviation within a forty-mile radius of the city and plan for future accommodations as far ahead as 1960.

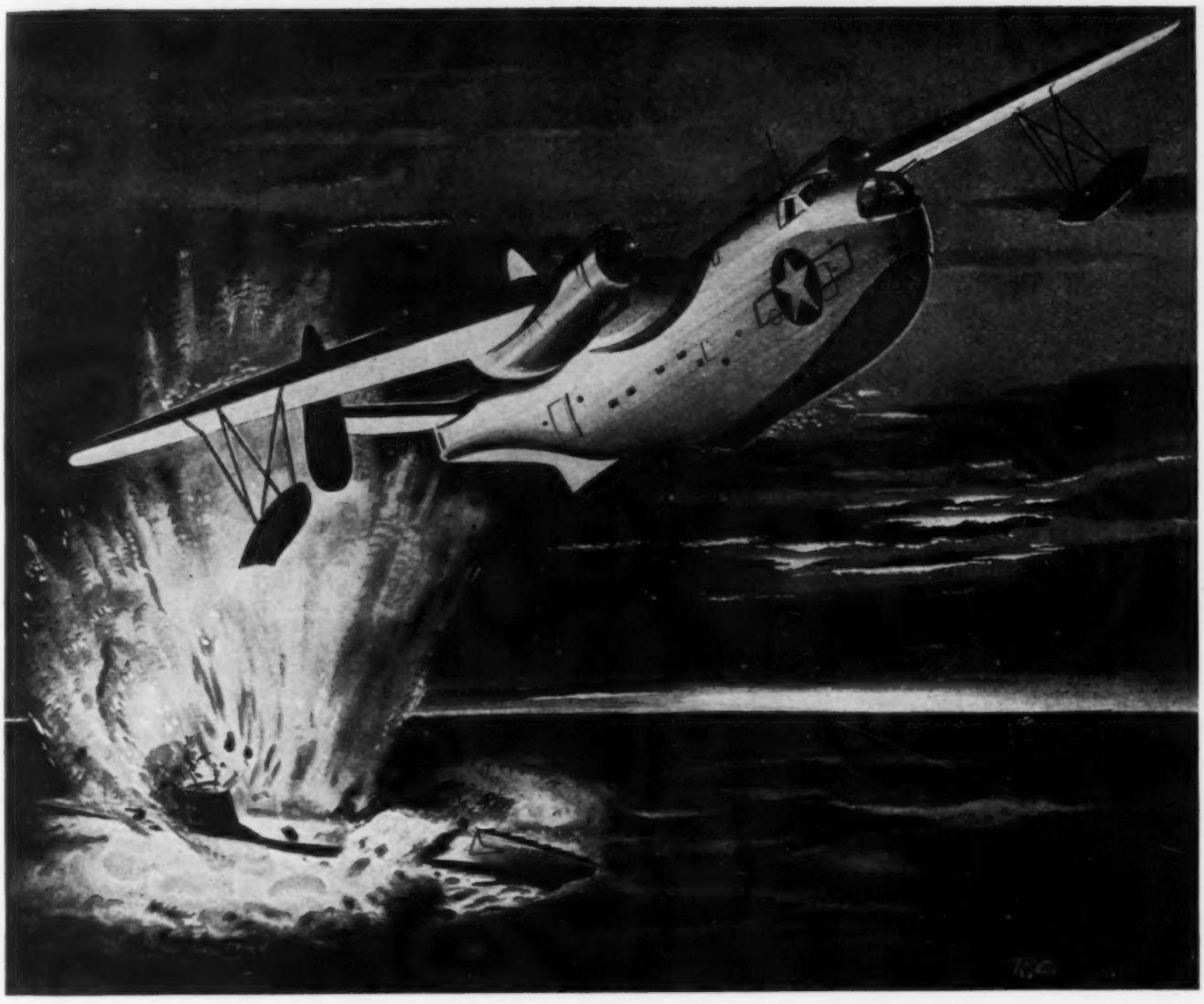
Specifications for the analysis and plan are about ready, it was announced by Sheldon B. Steers, director of the Board, and the Authority desires to contact firms competent to provide the service needed. Any firms interested in the project should communicate with S. M. Dean, chairman, Detroit Metropolitan Aviation Planning Authority, 2000 Second Ave., Detroit, Mich., for complete information.

Aviation Supply Corp. Opens Miami Warehouse

Lion G. Mason, president of the Aviation Supply Corporation, has announced opening of a new warehouse at 3014 Coral Way, Miami, Fla., to operate as a branch of the organization's Orlando warehouse. The new quarters will be used temporarily until more ample warehousing space is obtained in Miami.

The Miami warehouse will serve as a shipping and receiving point rather than a regular store, the Aviation Supply store being located at Orlando under management of Bertram C. Nelson. The new warehouse will feature pilot supplies, covering materials, and hand machine tools at the start. H. B. Jenkins will serve as manager, assisted by Mr. Sherwood.

Aviation Supply now has regular stores in operation at Orlando, Charlotte, Nashville, and Atlanta. Facilities at the headquarters in Atlanta are now being practically doubled by acquisition of an 80x80 hangar for storage of bulk material, which will supplement the present space of 60x120 feet including offices.



WINGED FOR VICTORY *by Fairchild*

On wings built by Fairchild, the Navy's big patrol bombers—Martin PBM-3 Mariners—fly to war over the seven seas.

They've sent many a submarine to the bottom. They soar by the hundred over icy arctic waters; patrol the far reaches of the Pacific; carry bombs and munitions, cargo and men to combat on distant naval fronts.

Behind their constantly increasing numbers is the story of industrial America at war—the story of American vision, enterprise, initiative and cooperation combining to accomplish the "impossible".

Three years ago there was a critical need for these big flying boats. Fairchild undertook the job of building the vital wing panels despite the fact that Fairchild had just launched a heavy production schedule, building famous Cornell primary trainers for the Army Air Forces, and manufacturing other Fairchild-designed aircraft.

In this day of industrial miracles, this Fairchild accomplishment stands as another example of the job that can be done with cooperation, technical knowledge and production skill.

BUY U. S. WAR BONDS AND STAMPS

Fairchild Aircraft

Division of Fairchild Engine & Airplane Corporation, Hagerstown, Maryland....Burlington, North Carolina

TYPICAL JAP AIRSTRIP—wet, muddy and full of ruts. After U. S. paratroops took this strip on Noemfoor Island, Air Engineers moved in to improve it according to American standards. This takes anywhere from two hours to two weeks; generally closer to two hours.

—(Army Signal Corps Photo.)

TENNESSEE

(Continued from page 49)

vailed upon our friends to introduce a bill in Congress to establish a nation-wide Women's Pilot Training Program. The bill is pending at the present time.

Following a recommendation made by the Civil Aeronautics Administration, the Bureau produced in February, 1943, a moving picture emphasizing the Women's Research Pilot Instructors' Course, entitled "A State Grows Wings." This picture has had widespread distribution. The Nelson Rockefeller Committee on Inter-American affairs has used the picture on a number of occasions.

The first edition of the book entitled "Facts on Aviation for the Future Flyers of Tennessee," was published by the Tennessee Bureau of Aeronautics, and distributed through the Public School System in Tennessee in 1941. The second edition of this book, consisting of 60,000 copies, was issued in March, 1944, and furnished to the children of Tennessee without charge. A third edition of 100,000 copies is now being printed for distribution to the children of the grade schools at the opening of the fall term.

In April, 1944, America's first program for mass aviation indoctrination of high school teachers, under the sponsorship of the Tennessee Bureau of Aeronautics was started at the Austin Peay State College at Clarksville, Tennessee. Seventy-four started and seventy-one graduated. One hundred Tennessee high school teachers were given basic aviation training which will aid them in teaching subjects relating to aviation in the public schools of Tennessee. Twelve weeks of ground school instruction coupled with ten hours of dual control flying instruction under direction of the college was given. All expenses of the teachers holding these scholarships were paid by the Tennessee Bureau of Aeronautics.

As a result of the success at Clarksville, Tennessee, the Bureau has now extended this program of mass indoctrination to the Memphis State Teachers, Austin Peay State College, Middle Tennessee State College, Tennessee Polytechnical Institute, East Tennessee State College and University of Tennessee Junior College. Forty scholarships were made available in each school. Two hundred high school teachers in Tennessee who won this scholarship are being taught the necessary ground subjects and in addition will be given ten hours of free flying instruction. We do not propose to make pilots of them but intend to make better aviation teachers of them.

Engineering, Architectural Services

In July, 1944, the Bureau made an allocation to the University of Tennessee for the purpose of establishing (1) An Airport Development Laboratory and (2) An Airport Instrument Laboratory. These are the new steps in the development of the aviation program in Tennessee. The Airport Development Laboratory represents a plan whereby the resources of the University are made available to render technical services in improving, planning and developing flying services and airports in Tennessee. The University will furnish technical personnel trained in airport planning, in site selection and investigation, in design of pavements and structures and all other phases of airport development. The services of the departments of meteorology, geography, geology, and physics, its technical library as well as the University staff will be available to political subdivisions desiring advice throughout Tennessee.

The Airport Instrument Laboratory will provide facilities for testing and research in aircraft instruments, aircraft radio and radio control instruments. The University through the Bureau's facilities will furnish direct service to aircraft owners as well as owners of private aircraft and will serve as technical advisory agent of the State Bureau of Aeronautics.

The Bureau believes in practical education and to that end we financed the cost of 100 aviation cadets who were selected by the CAP and who received two weeks training at Smyrna Air Base in Tennessee.

We are furnishing to our cities the best engineering and architectural services that can be purchased in America. We are constructing hangars, refinishing runways, building control towers, furnishing seed and bluegrass for sodding, water supply and sewerage disposal systems, building roads, making airfields more accessible, erecting directional signs on the roads leading to airports, building water mains, grading, and as of December 1, 1941, we had placed 327 markers on tops of buildings throughout the State, more than three for every county in Tennessee.

I suspect some of you have been wondering where the money comes from. Under our law, the sum of money equivalent to the aviation gasoline tax of seven cents, is turned over to the Bureau. One-half of this tax goes back to the port of origin. The balance is used by the Bureau for the purposes described.

The cost of operating the Bureau is less than two per cent of the fund passing through our hands. We believe we operate cheaper than any Community Fund or Red Cross. We feel that we are trustees for the taxpayer. The members of the Bureau receive no compensation.

We are considering a state postwar plan for an "Air Age" in Tennessee, which we hope will result in new industries for Tennessee; produce employment for returning War Veterans; produce national publicity; maintain the State's established leadership in aviation affairs; establish flight strips, located at points which will facilitate travel to the scenic, historic and recreational areas throughout the state.

It is fitting this paper should close with a reference to the National Honor the State of Tennessee received in the Capitol Building of the United States, on December 17, 1943, when Vice President Wallace presented to the Tennessee Bureau of Aeronautics a certificate from the Brewer Award, for Tennessee's "Outstanding Contributions to the Development of Air Youth in the Field of Education and Training." The state of Tennessee was the only state to receive this recognition. We have travelled a hard road, but the promise of new horizons for tomorrow beckons to all of us. ★ ★ ★

HORSEPOWER OUTLOOK

(Continued from page 31)

true gas turbine, also by the turbo-supercharger which has been in use for many years.

England, with its urgent problem of interception, was one of the first to push development of the jet propulsion plane. The jet plane at the present time has a limited sphere of use, due to its high fuel consumption, but it is excellent as a high speed, high altitude fighter or interceptor. Like fighting fire with fire, it offers a possible solution to the self-propelled bombs. The geographical position of the United States and its engine needs quickly becomes apparent in the emphasis placed on gas turbine power. Within the past month the Wright Aeronautical Corporation announced that it was at work on true gas turbines, a form of engine which can be used with a conventional-type propeller and which is adaptable to long range high speed bombers, cargo carriers or passenger transports, all flying at altitude.

Of course the principles of the turbine engine have been known for years. They are internal combustion engines, like the present internal combustion, reciprocating engines, but they hold out the promise of eventual lower weight per horsepower due to their type of construction. They have come into use at about this time for two reasons. One reason is more efficient design, and the second is development of new metallurgical processes to produce the alloys necessary to withstand the head and stress of turbine operation. Still another factor is that of use, for an engine is of little value unless the plane is designed for it. It was only in 1941, for instance, that the first plane flew with engines of 2,000 horsepower. Prior to that time such engines would have had little utility. In a corresponding situation, planes are just now being designed for turbine engines of high power. All in all the plane designer now has considerably wider choice of power plants than he has ever had before. He has the radial engine in any combination of from three cylinders on up; he has the air-cooled in-line engines; he has the liquid-cooled engines of many types. He also now has the jet propulsion units. He will soon have gas turbines of high power.

Future Trends

After the war a crystal gazer might see the engine trend something like this: In the commercial field the feeder lines, main trunk lines, and transcontinental and transoceanic planes will most likely use air-cooled radial engines of from 400 to 3,000 and more horsepower. Simultaneously, development will most likely be pushed on the gas turbines for use on giant transports and bombers. The radial engines in commercial and military planes are expected to be decidedly more efficient than the engines now in use. This is not because of any radically new developments but due to continual refinement and the introduction of all the new developments of wartime. Available on commercial engines will be forged-head "W" fins, new alloys, new lubrication and ignition systems, improvements in carburetion and valve, piston and combustion chamber design. Typical of this trend is the Wright Cyclone 9, which at 1,350 horsepower now has a weight horsepower ratio of only 0.97 lbs. per horsepower. It is only logical that in this and other engines further power increases will be made with further weight reductions. In the higher powered engines, fuel injection will probably replace the standard or conventional type carburetor. It is not likely that fuel injection will be widely used on the small engines, primarily due to costs.

If you talk to the larger engine manufacturers you will find them not too enthused about the small horsepower ranges or about building power plants which might be interchangeable between automobile and plane. They point out, as their basic reason for this attitude, that the volume in the light plane field is not particularly attractive at the present time. Quality differences, in better materials and more precise manufacturing and inspection methods, account for the cost differences between aircraft and automotive type engines. As an example, it is indicated that the engine in an automobile which retails for $900.00 costs considerably less than $100.00, whereas the same power in an engine for an aircraft is almost impossible to build for less than three or four times that sum.

In the military field, there is a use indicated for all types of engines; the radial, the in-line liquid-cooled, the jet and the gas turbine. Or there may be combinations of such units. There is no reason to believe the development of radial engines will stop anywhere within the 2,000 or 3,000 power ranges. Long-range, slow-flying patrol bombers may be needed for fighting submarines, unless radar and similar developments eliminate the U-boats, but the present characteristics of the turbines would seem to indicate inefficiency at such low level, slow patrol. For such planes, radials of anywhere up to 5,000 horsepower may be the answer.

In summary the outstanding production engines for the postwar period would seem to be the gas turbine, at power levels up to 10,000 horsepower; the jet propulsion engine, for use in fighter and interceptor planes formerly powered by in-line liquid-cooled engines; and the air-cooled radials, for use in commercial planes and certain types of military aircraft. Below the feeder line level — that is, in the private, training and semi-commercial field — the present line of air-cooled types seems logical for continuation.

Immediate Price Reduction Unlikely

The liquid-cooled in-line engine may continue for use in several types of military planes but its use in large commercial transports appears rather dubious.

On the general subject of costs, it is far from certain that there will be any immediate reduction in power prices after the war. During World War II, the engine industry has had its first opportunity to tool up for high quantity production. It was not true mass production, but it was certainly close to it and the volume of orders permitted use of special machine tools, progressive assembly lines and other production and inspection methods more commonly associated with mass production of consumer goods. Typical of such tools is the 200-foot Greenlee automatic cylinder head transfer machine in use in the Wright Aeronautical plants. Every forty-eight seconds, a fabricated cylinder head emerges from the end of this machine. The heads are, of course, all for the same model engine.

As for performance, there is no indication that power loadings will vary much from those in present use. It all depends on whether the operator is selling speed or load capacity. If the first, then he uses an engine and loads it lightly. If the second, he most likely will use the same engine, at the same power, and step up his power loading to the levels which military experience of this war has found quite practical.

But one thing is certain. Gradually, overhaul hours will stretch towards the thousand-hour mark. Weights for all types of engines should drop below the pound per horsepower level. Fuel consumption specifics should be well below present levels. It won't be sudden, like changing from khaki to civvies, but it will be sure. ★ ★ ★

SKY'S THE LIMIT

(Continued from page 22)

thing. Plenty of patent snap fasteners for getting cowling off in a jiffy; plenty of visibility. A tricycle gear is superb for taxiing visibility. Nothing else can compare. A constant-speed propeller with no controls — that's something. We have long contended that the plane of the future would have to be almost automatic and foolproof. As time goes on perhaps we will get that dream plane. For the time being, though, we were well pleased with the immediate prospects. There are going to be some swell new airplanes.

Thoughts While Wishing

Our idea of a dream airplane would be something with enough carrying capacity to haul five persons, and that would mean about 150 pounds of baggage. Lots of times you need to take three or four persons with you, especially if it's a fishing or hunting trip, and many times if it's pure business. And most anytime it needs to be a plane trip, you are going several hundred miles, and you will need several changes of clothing, perhaps an overcoat, and perhaps guns, fishing tackle, cameras, etc. Then, if it's a long way off—because you don't get two-week vacations six or eight times a year, you are in a hurry—you have to make it in one afternoon. That means you must have speed of 120 at the very minimum. When the headwind blows, which is almost always, you find it is 20-40 miles an hour—right on the nose. A speed of 120 minus 20 lets you amble along at 100 mph. Minus 40 means 80 mph, which, less the taxi and take off time, and the time lost by wandering a bit off course, means you could go just as fast in a car, and have it there to use. We have had a number of 140- and 160-mile airplanes and once owned a talking interest in one that did 180 on the level. It makes a lot of difference in what you can do with them. As an example, we were three days, and twenty hours of flying time, coming from California to Tulsa in a Stinson 10-A. Several times we made it in eight hours or less, in one day, in a Beechcraft we had. Since seven or eight hours is about enough to fly in one day—leaves your ears ringing, and the ceiling swings around on you when you get in bed that night—we need airplanes for cross-country work that will make it in that length of time.

As our pal, Jack Huff, once said, it doesn't do any good to put six hours of gas in one of them if it only has three-hour seat cushions.

Then it should have plenty of power to yank this stuff off of a short field with trees at the end. Our life has already been shortened enough by these "hardly-able" airplanes that you wish over the highline by inches. And if it is at altitude it needs some supercharging. Phooey on this having to hunt updrafts in order to get a few feet of altitude. A fellow wrote us the other day saying that a constant-speed prop would take the place of a supercharger. Well, not for our money, because these unsupercharged engines usually start losing power rapidly above 3,000 feet, and if you are at 6,000 feet or above, as one of my friends was the other day at Casper, and it won't pull the hat off your head, you crack up, which he did. It cost him $2,500 to fix up his ship. If he had had a supercharger when the thing was new he would have saved himself a lot of gray hair —and me too, as I once watched him struggle off with an overload at sea level. All a constant-speed prop does is let you get all the horsepower that the engine is developing, not what it is rated for. Of course a constant-speed prop, properly designed, always helps, but if it did everything why would Messrs. Pratt and Whitney always put blowers on their engines? Actually, you need both superchargers and controllables.

Then we need enough instruments to stick our nose in the soup with a fair degree of safety. This means turn and bank, sensitive altimeter, rate of climb, a gyro-compass (if possible), a good radio receiver and transmitter with plenty of range, and a radio compass, or at least a loop for homing. Having had a little radio trouble

(Continued on page 86)

Airmen's Calendar

November 13-14—National Association of State Aviation Officials, Skirvin Tower Hotel, Oklahoma City, Okla.

November 15-18—Second Annual National Aviation Planning Clinic, Oklahoma City, Okla.

November 15-18—WNAA National Convention, Biltmore Hotel, Oklahoma City.

December 4-6—SAE National Air Cargo Meeting, Hotel Knickerbocker, Chicago.

December 5-7—Aircraft Distributors and Manufacturers Association Second Annual Convention, Jefferson Hotel, St. Louis.

December 6-7—National Aviation Trades Association Convention, Jefferson Hotel, St. Louis.

December 17 — Eighth Annual Wright Brothers Lecture, Institute of Aeronautical Sciences, U. S. Chamber of Commerce Auditorium, Washington, D. C.

May 20-27—Pan-American Aircraft Exposition, Dallas.

Makers of Precision small parts for the Aviation Industry

★ ABILITY ★ PRECISION ★ PRODUCTION

DOLAN AIRCRAFT MANUFACTURING COMPANY

DALLAS, TEXAS

A Triumph of Planning

So writes

WALTER DORWIN TEAGUE

noted industrial designer, in describing Bell Aircraft's advances in aircraft production for the war effort today... for *all* tomorrow.

Sealing tubes with the Marsh Metal Tube Seal — a Bell Aircraft innovation now widely used by the aircraft industry.

"I WITNESSED a triumph of planning when I walked through Bell Aircraft's Niagara Frontier Division Plant. I have seen many impressive plants but seldom such perfect order and such high efficiency on so vast a scale.

"It was easy to sense the pride of craftsmanship in the men and women who work there: it became vocal in the machinist who demonstrated his tube-bending machine for me, and the foreman who showed the method he himself had invented for sealing aluminum hydraulic tubes to keep them dust-free.

"And then, from this demonstration of perfected techniques, we went to the laboratories, where scientific knowledge and inventive genius must still work with experimental methods to solve problems that have no precedent. Instead of the calm assurance of the big assembly plant, the atmosphere here in these technological maternity wards was one of barely suppressed excitement: hurry, tension, exhilaration, but above all, confidence.

"This was an event to be remembered, because I saw for the first time two of the most spectacular developments in aviation: I saw the Bell helicopter hover and swing under perfect control within reaching distance of the ground, and I had my first glimpse of a jet propulsion plane. The Bell crowd evidently is as adept at design as it is skilled in manufacturing.

"There are many people I know whom I'd like to take through that plant and those laboratories. They would have a better understanding of what modern industry has grown into now that it's really hitting its stride, and what the future offers in aviation progress for our nation's prosperity."

★ *Buy War Bonds and Speed Victory* ★

MEMBER AIRCRAFT WAR PRODUCTION COUNCIL...EAST COAST, INC.

BELL Aircraft

PACEMAKER OF AVIATION PROGRESS

NIAGARA FRONTIER DIVISION
Buffalo and Niagara Falls, N. Y.
Airacobra (P.39) and Kingcobra (P.63)—Fighters
Airacomet—America's First Jet Propelled Plane
The Bell Helicopter

ORDNANCE DIVISION
Burlington, Vt.
Flexible Gun Mounts and other ordnance materials

GEORGIA DIVISION
Marietta, Ga.
B-29 Boeing Superfortress

© Bell Aircraft Corporation

First Photo, Details of A-26

Douglas Aircraft Company has released the first photo (at left) of its high performing A-26, the Army's newest light bomber for low altitude bombing, strafing and night fighting. Armament, omitted from the picture, includes the most flexible selection of machine guns, cannon and bombs ever mounted on a U. S. warplane.

A-26 performance, while not detailed, reaches a new high for twin-engined bombers. Its NACA laminar flow wing is exceptionally flat and fast, and requires a new double-slotted flap for reduced landing speed and assisted take-off. It is powered by two Pratt & Whitney 2,000 hp. engines of the R-2800 series.

Considerably larger than the A-20 which it supersedes, the A-26 is a single-pilot craft, has tricycle gear and "squared" tail. Called the "Invader", it has already entered action and is being produced in large quantities at Tulsa, Okla., and Long Beach, Calif., where significant strides in aircraft manufacture have been accomplished with it. It embodies principles which obsolete previous production methods as effectively as its performance obsoletes the planes it will replace in combat.

AIR POWER *In Action*

By TOM ASHLEY

ALTHOUGH the headlines spotlighted last month's defeat of the Japanese Imperial fleet, the Philippines victory netted far-reaching aviation dividends. The enemy fleet was officially said to have been virtually wiped out, with fifty-eight of the sixty or so units sunk "or damaged." That seemed to convince everyone the Japanese Navy is now at the bottom of the sea, although there are some realists, especially those being shot at on the scene, who insist that "damaged" warships can put up a fair fight, especially after being repaired. But even if the Imperial fleet was wiped out, there still remained land-based Japanese air power to reckon with.

Will enemy land-based air power delay the U. S. sea drive against China and the Japanese homeland? That question is as important, if not more so, as the puzzle over the enemy fleet, for our sea drive depends on land-based air cover to penetrate vital inner Japanese defense zones.

General MacArthur's successful October invasion of Leyte, in the heart of the Philippines, furnished a large part of the answer to the foregoing question. The Navy's carrier challenge to Formosa, which went uncontested, might provide a part of the answer. MacArthur is establishing land bases for strategic air power squarely astride the Japanese sea route to Singapore and the rich war resources below the South China Sea. Long-range bombers will blockade that area to choke off half a million or more enemy troops, together with their supporting Japanese air, naval and shipping components. To the North, MacArthur's land bases will pour long-range strategic air power against Formosa and the China coast, thus providing the necessary pre-invasion counter air offensive in support of the forthcoming sea drive. All the while U. S. air power in China, such as demonstrated by B-29 actions supporting the carrier offensive against Formosa, will throw in its pressure, and Japan's land-based air defenses thereabouts will be the target of aerial pincers.

Land-based air support for the Navy in the far Pacific has been growing steadily. It started at Pearl Harbor with the valiant 7th Army Air Force, and began to spread with the Gilberts and Marshalls campaign, when land-based Navy and Marine units entered the project with strength. It now reaches beyond the Marianas, while from the Arctic the Aleutians springboard continues to apply heavy land-based air pressure against the Kuriles.

Past strategy indicates the next phase beyond the Philippines will be chiefly an air war. Land-based U. S. air power will be expanded in the islands, first to bulwark its defense and then to operate 24 hours a day across

LOSSES IN THE AIR WAR

September 26-October 25, 1944
(Does Not Include Probables or Damaged Totals)

	Europe		Italy		Southwest Pacific		Russia*
	Enemy	Allied	Enemy	Allied	Enemy	Allied	Enemy
Sept. 26	34	27	....	11	....	....	36
Sept. 27	115	65	....	1	....	3	9
Sept. 28	36	63	....	....	5	2	35
Sept. 29	2	1	2	....	2	....	....
Sept. 30	31	16	1	4	....	....	23
Oct. 1	....	....	....	3	....	....	29
Oct. 2	....	....	....	2	....	....	18
Oct. 3	2	30	1	8	5	....	8
Oct. 4	....	14	1	....	8	5	....
Oct. 5	....	....	3	3	....	1	7
Oct. 6	85	60	....	11	3	....	....
Oct. 7	102	104	2	18	....	....	34
Oct. 8	52	76	....	3	....	....	31
Oct. 9	5	16	....	4	....	....	130
Oct. 10	....	2	3	5	....	1	78
Oct. 11	....	13	....	9	2	1	62
Oct. 12	12	15	18	20	....	....	26
Oct. 13	....	....	2	44	....	....	56
Oct. 14	22	46	3	26	1	....	38
Oct. 15	9	65	1	2	....	1	61
Oct. 16	....	16	19	16	1	....	57
Oct. 17	....	33	4	24	....	....	73
Oct. 18	6	19	....	1	....	....	69
Oct. 19	....	40	2	5	....	....	50
Oct. 20	....	....	4	11	....	3	40
Oct. 21	21	4	....	4	5	....	26
Oct. 22	....	1	....	4	5	....	31
Oct. 23	....	12	....	28	66	7	47
Oct. 24	5	18	....	9	56	2	67
Oct. 25	2	17	....	1	79	....	37
TOTALS	541	773	66	277	238	26	1178
Totals since Jan. 1	7503	6960	3857	2962	2064	330	12491

*RUSSIA: Does not reveal own losses.

CHINA: Sixty-nine enemy planes destroyed at loss of twenty-four. Totals since January 1, 755 enemy, 201 Allied.

PACIFIC: Thirteen hundred and ten enemy planes destroyed at loss of sixty-eight. Totals since January 1, 4,025 enemy, 389 Allied.

SOUTHEAST ASIA: Seventeen enemy planes destroyed at loss of fifteen. Totals since January 1, 392 enemy, 213 Allied.

MIDDLE EAST: Eighteen enemy planes destroyed at loss of one. Totals since January 1, 77 enemy, 75 Allied.

(Note: These figures are compiled by SOUTHERN FLIGHT from daily headquarters communiques issued by the respective commands. They are, therefore, subject to periodic adjustment. Dates for Southwest Pacific are those on which figures are released; others when action occurred.)

All that remains of the big 4-motored Jap flying boat after direct hits by U. S. Navy Liberator gunners is this wing tip with its Rising Sun insignia . . . No question about it, this Rising Sun is setting fast. Official U. S. Navy Photograph.

ONCE THERE WAS A JAP FLYING BOAT • •

It is merely small pieces now — thanks to the deadly aim of an American gunner aboard one of our huge Consolidated Liberators. These men on the firing lines of the air are doing a magnificent job . . . and American industry is backing them up with the finest aircraft in the world.

Everyone at CECO is proud that CECO carburetors and fuel pumps on the newest great Liberators and other warplanes play a direct part, however small, in helping bring Victory closer.

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The WORLD'S WINGS

By LUCIEN ZACHAROFF

NO longer are commentators asking: Will Russia join the war in the Far East? Rather, the query is: When? The answer is that Russia has been at war with Japan for some time, though an open break and the shooting stage are still to come.

In our times no one is so naive as to take surface diplomatic niceties at face value. Modern wars are not fought and won on military battlefields alone. It is the entire complex of military, political, industrial, ideological factors that decides the outcome of international conflicts.

Taking this into account, recall that until the Allies inaugurated their decisive Western Front in Europe last summer, the Soviet Union had borne the brunt of containing and even of defeating the senior Axis partner, enabling the United States and Great Britain to carry on in the Pacific theatres. Think of how bleak our outlook in the Pacific would be had Hitler overrun Russia. Such a catastrophe would have spelled the doom of England, and a juncture of the German and Japanese forces somewhere in Siberia, the Near East, China, or India. And worse!

Japan has felt the Russian might and role as a temporarily "silent partner" in the Allied enterprise in Asia. Moscow has never appeased Tokyo before or since the outbreak of the global war. In the formidable border clashes, like those precipitated by the Nipponese at Changkufeng and Nomonhan, the aggressors received staggering rebuffs from the Red air and ground forces.

On the economic front, the Soviets have been progressively stiffening their attitude to Japan's vital concern about fishing rights in the Russian Pacific waters, about the oil field concessions in Southern Sakhalin, and so on.

And to this the USSR's aid to China long before any other power did so, the ill-concealed delight of Soviet newspaper editors every time they report United Nations victories against the Japanese, and the well known contempt for and hatred of Japanese imperialism on the part of the Russian Man in the Street.

Japan's Notorious "Mein Kampf"

Ever since the Russian Revolution, Japan's war lords have cast their covetous eyes on Siberia's rich resources. Thrown out of the Soviet Far East in 1922, the Tokyo militarists have continued to urge a "positive policy". Their **Mein Kampf** has been the notorious **Tanaka Memorial** of July 25, 1927, a secret memorandum presented to the Emperor by the then Prime Minister, Baron General Tanaka, who had served as Chief of Staff to Marshal Kadoma at the siege of Port Arthur in the Russo-Jap War of 1905.

Closely duplicating the Nazi pattern of conquest, the **Tanaka Memorial** program has been consistently and relentlessly carried out by Japan since 1931. The dastardly stab in the back at Pearl Harbor was a part of Tanaka's agenda. The **Memorial** has frequent references to the Union of Soviet Socialist Republics, of which the following are typical:

"That we should draw swords with Russia again in the fields of Mongolia in order to gain the wealth of North Manchuria seems a necessary step in our program of national aggrandizement. . . .

"Looking into the future of Japan, a war with Russia . . . is inevitable.

"Manchuria and Mongolia are the undeveloped countries in the East. Over this territory we shall have to go to war with Russia sooner or later."

Diplomatically speaking, can the USSR—which has attained so imposing a stature in world affairs—afford not to make a major military contribution to the ultimate United Nations triumph in Asia and thus not be in the strongest possible position at the peace table in settling the destinies of that quarter of the globe? The safest guess is that it is all a question of timing. Considering the degree of inter-Allied cooperation and mutual confidence already achieved at the Dumbarton Oaks, Teheran and Moscow conferences, it is not to be doubted that an understanding has been reached on this foremost issue.

The Japanese know it better than some ignorantly speculating elements in our own country. The Tokyo High Command has been retaining its Kwantung Army's crack divisions in Manchuria where they will be sorely needed in the coming showdown with the famous Far Eastern Red Banner Army, the Pacific Fleet of the Red Navy, and the remarkable Soviet air power, of which more next month. ★ ★ ★

the South China Sea in a strangling blockade. Finally this superior land-based air power will begin the neutralization of Japanese air strength in Formosa, along the China coast, and in the home islands themselves, softening up those areas for closer actions by Navy carrier forces and eventually for invasion. Of one thing we may be sure — the U. S. fleet, strong as it is, will deliver its major punches only in co-ordination with far-ranging, land-based air support.

This maturity of air power, with sea and land components combined, is speeding destruction toward Japan. The enemy fleet, damaged or sunk or hidden, will be able to do little to thwart it. ★ ★ ★

More Bombers Than Fighters Produced By U. S. Since 1940

Detailed figures of U. S. aircraft production by type, from July 1, 1940, to September 30, 1944, are as follows:

Bombers	74,953
Fighters	70,627
Transports	17,592
Naval Reconnaissances	2,345
Trainers	54,642
Communications	10,785
Special Purpose	1,459
Total	232,403

BOMB DAMAGE is graphically illustrated by these Army Air Forces photos. Top shows interior of a hangar with planes and floor blown into disarray. Center photo shows earthquake wreckage in enemy railyard. At bottom is all that remained after bombing of once-busy railyard at Cecina, south of Leghorn on West coast of Italy.

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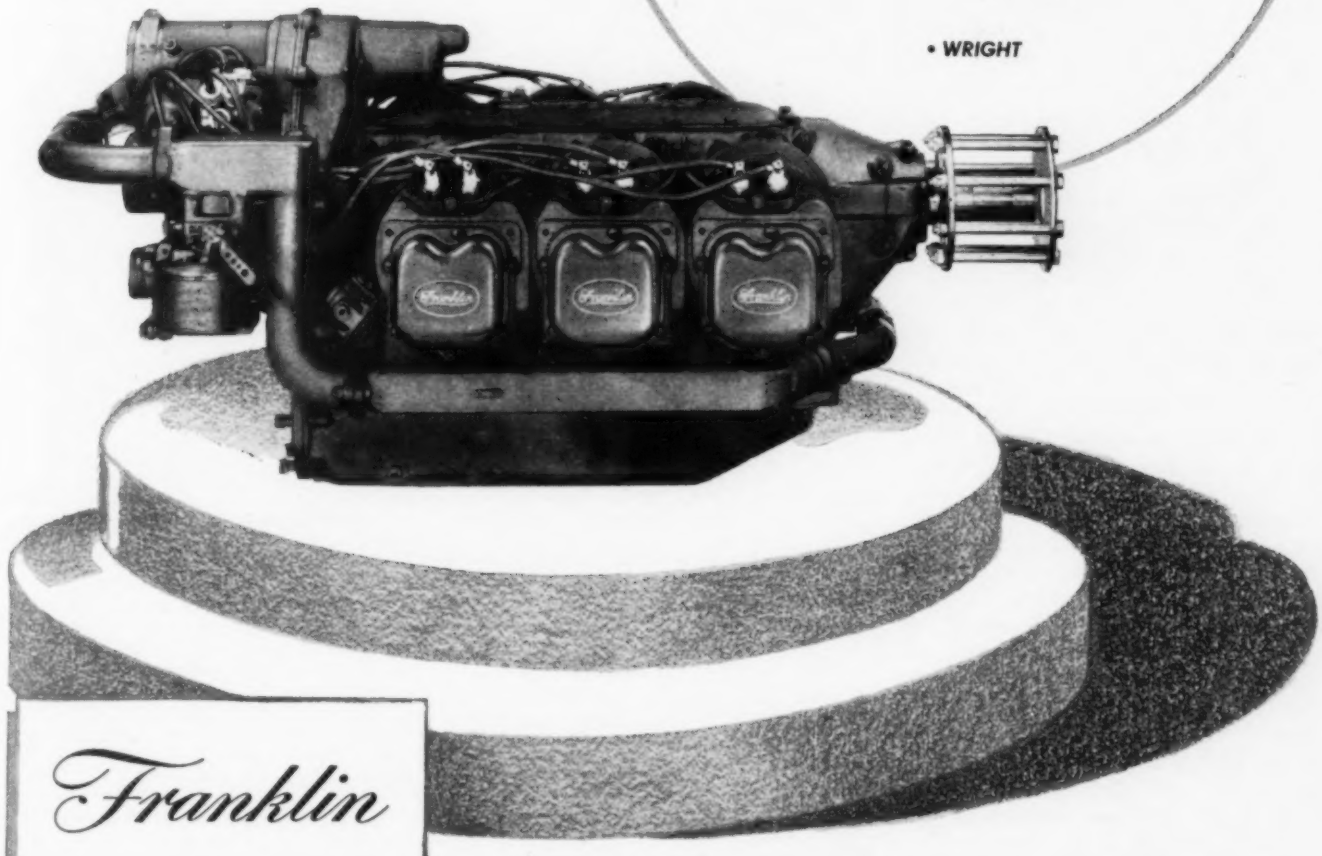

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SCINTILLA MAGNETO

DIVISION OF **Bendix** AVIATION CORPORATION
SIDNEY, N. Y.

YOU ASKED FOR IT

Safety Bureau, Civil Aeronautics Board, sends out an appeal for your comments and suggestions on proposed revisions of Civil Air Regulations Part 24 covering airplane and engine mechanics.

PURSUANT to CAB authorization, the Safety Bureau continues its efforts to overhaul and simplify Civil Air Regulations. Augmenting previous suggested revisions, consistently reported in these columns, are the fundamental modifications the Bureau proposes for Part 24, relating to Mechanic Certificates. Your comments are desired. Suggestions should be sent to the Safety Bureau, Civil Aeronautics Board, Washington 25, D. C.

Under the new proposals a mechanic will be issued a certificate detailing all of the ratings for which the holder has been found competent. Category ratings are broken down to cover light and heavy airframes, light and heavy engines, propellers, instruments and radio. Likewise a distinction is made between maintenance and service on one hand and repair and overhaul on the other. As detailed below in the proposed revisions, aircraft, airframes and engines have been divided into light and heavy categories as determined by maximum authorized weight and rated horsepower. For example, a light aircraft is an aircraft of 5,000 pounds, or less, maximum authorized weight; a light engine is an aircraft engine of 500 horsepower or less.

Under this division a so-called "line mechanic" may perform maintenance and service work on any part of the aircraft, whereas such a separation is provided with respect to repair and overhaul. Mechanics would be rated as first class or second class, as determined by the amount of experience.

Mr. Jesse W. Lankford, Safety Bureau director, points out that the rating structure has been prepared on the basis of the needs of the individual mechanic and the small operator rather than on the needs of the large organized repair station or airline maintenance base. The Bureau believes that the large certificated repair stations and airline maintenance bases can be more appropriately handled on the basis of requirements for proper supervision and inspection and appropriate personnel qualifications rather than on the holding of individual mechanic certificates.

SUGGESTED REVISION OF PART 24 — MECHANIC CERTIFICATES

24.0 Issuance.
24.1 Minimum Requirements.
24.2 Tests.
24.3 Privileges and Limitations.
24.4 Miscellaneous Rules.
24.5 Definitions.

24.0 Issuance

24.00 *Mechanic certificate.* A mechanic certificate will be issued by the Administrator to any responsible person who demonstrates compliance with the minimum requirements prescribed herein.

24.01 *Rating record.* A rating record showing one or more category and class ratings for which the holder has been found qualified will be issued in connection with a mechanic certificate.

24.02 *Ratings.*

24.020 *Category ratings.* Category ratings are as follows:

(a) maintenance and service—light aircraft,
(b) repair and overhaul—light airframes,
(c) repair and overhaul—light engines,
(d) maintenance and service—heavy aircraft,
(e) repair and overhaul—heavy airframes,
(f) repair and overhaul—heavy engines,
(g) propellers,
(h) instruments,
(i) radio.

NOTE: See § 24.5 for definitions.

24.021 *Class ratings.* Class ratings are as follows:

(a) *Second class.* Issued only for aircraft, airframe, and engine categories,

(b) *First class.* Issued for all categories.

24.03 *Duration.* Mechanic certificates will be of temporary duration for ninety days after the date of issuance during which period they may be recalled or changed by the Administrator. Thereafter the certificates will have no expiration date unless such date is hereafter fixed by the Board. Any suspended or revoked certificate must be surrendered to the Administrator upon request.

24.1 Minimum Requirements

24.10 *Age.* Applicant must be at least eighteen years of age.

24.11 *Citizenship.* Applicant must be a citizen of unquestioned loyalty to the United States or a loyal citizen of a friendly foreign government not under the domination of or associated with any government with which the United States is at war.

24.12 *Knowledge.* Applicant must have a general knowledge of construction, functioning, inspection, maintenance, and repair of aircraft, aircraft engines, propellers, or appliances in those categories appropriate to the ratings sought. He must also be familiar with such provisions of the Civil Air Regulations and their Manuals as are applicable.

24.13 *Experience.*

(a) *2d class ratings.* Applicant must have had at least one year's practical experience or its substantial equivalent with the processes, practices, materials, tools, instruments, and machinery generally used in the inspection, maintenance, service, repair, overhaul, or alteration of aircraft, airframes, engines, or appliances appropriate to the rating sought.

(b) *1st class ratings.* An applicant for an aircraft maintenance and service, an airframe repair and overhaul, or engine repair and overhaul rating must have at least three years' experience as a certificated mechanic or its substantial equivalent. In addition, the scope of the experience and the quality of the work performed by the applicant must be such as to demonstrate his fitness for the rating. An applicant for a propeller, instrument, or radio rating must have at least three years' experience or its substantial equivalent with the processes, practices, materials, tools, instruments, and machinery generally used in the inspection, maintenance, service, repair, overhaul, and alteration of that portion of the aircraft appropriate to the rating sought.

24.2 Tests

24.20 *Examinations and tests.* Written, oral, and practical examinations appropriate to the certificate and ratings sought will be conducted by an authorized representative of the Administrator. A passing grade in each subject of the examination or test will be 70 per cent or more.

24.200 *Re-examination.* An applicant for a mechanic certificate or rating who has failed any prescribed practical or theoretical examination or test may apply for re-examination in the part failed at any time after the expiration of thirty days from the date of such failure: *Provided*, That an applicant who has failed only the examination on the pertinent Civil Air Regulations may apply for re-examination on that subject after he has received not less than five hours of instruction from a certificated ground instructor and presents a statement from such instructor stating that he deems the applicant qualified to pass the required examination.

24.3 Privileges and Limitations

24.30 *Privileges and limitations.* Any person may perform work on an aircraft provided such work is performed under the supervision of an appropriately certificated mechanic. A certificated mechanic may exercise the following privileges according to his ratings:

(a) *Aircraft maintenance and service, 2d class.* Within the light or heavy aircraft rating specified on his rating record, he may supervise maintenance and service, and minor repair and overhaul, and he may make periodic inspections of aircraft, but may not return an aircraft to service after major repair, overhaul, or alteration;

(b) *Aircraft maintenance and service, 1st class.* Within the light or heavy aircraft rating specified on his rating record, in addition to the privileges specified in paragraph (a), he may return aircraft to service after major repair, overhaul, or alteration;

(c) *Airframe repair and overhaul, 2d class.* Within the light or heavy airframe rat-

First to Fight

The recent participation of WACO-designed, troop-carrying gliders in the Burma campaign was not WACO's first brush with the Rising Sun . . . for back in 1932, when the Japs first undertook the conquest of Shanghai, six WACO planes bearing the insignia of the Canton (Chinese) Air Force were among the first to fight!

Then, as in Burma 12 years later, Hirohito's boys came out a bad second best. Mounting two 30-cal. machine guns, these six WACO Straight Wings shot down a Jap observation ship and several seaplanes . . . and flew escort for three Vought Corsair O2U's which, acting as bombers, plastered an enemy landing field.

Although designed for commercial service, these early WACO planes took to combat like the Jap navy takes to its heels . . . demonstrated the same rugged dependability, stability and maneuverability that today characterize the performance of WACO gliders on every front . . . that tomorrow will characterize the WACO you'll want to fly. THE WACO AIRCRAFT COMPANY, 911 Peters Avenue, Troy, Ohio, U. S. A.

Waco

WACO AIRPLANES

ALL ARMY CARGO-TRANSPORT GLIDERS ARE WACO DESIGNED

Lower Costs Needed for Production

There are bright prospects for large-scale production of commercial light aircraft after the war, but if the industry is to achieve a healthy spiral of reduced prices, larger sales, better tooling with subsequent lowered prices, the place to start is on the basic cost of material and labor.

This was emphasized at the Society of Automotive Engineers National Aeronautic Meeting last month in Los Angeles by Chief Engineer A. G. Tsongas and Industrial Engineer F. S. Macomber of Stinson Division, Consolidated Vultee Aircraft Corporation, who pointed out that a dollar saved in direct manufacturing cost "means $2 off the selling price." They proposed that manufacturers of small planes undertake cost planning to educate the designer on every cost factor affected by design, give him a manual of summarized material and purchased parts costs for ready reference and a check list to use in avoiding unnecessarily expensive practices, provide for constructive criticism of initial drawings by key production men, entrust cost estimating to a consulting group in the engineering department, and finally establish a goal in cost per pound for the designer to try to meet.

Large Plane Maintenance

Other outstanding speakers participating in the sessions, and the points they brought out, included the following:

REAGAN C. STUNKEL, general service manager, Lockheed Aircraft Corporation: Postwar commercial planes too large for indoor servicing must be designed for maintenance by the perpetual overhaul, continuous operation method so as to keep them profitably in the air. He described an airplane maintenance system which permits the airplane to be operated eighteen hours daily and overhauled every 5,000 hours without being out of service or grounded for repairs longer than six hours at any one time, and reminded engineers that "inspection sheet" methods of recording performance of line maintenance operations are becoming obsolete.

Flight Deck Co-ordinators

RALPH S. JOHNSON, chief test pilot, United Air Lines, Inc.: Flight deck co-ordinators, by making operational scripts readily visible to busy flight officers, should be installed in large transport planes. The co-ordinator was described as an instrument comprising a case, located between the pilots, holding a well planned operational script on rollers under a light.

Eight-Wheel Landing Gear

ROY W. BROWN, Firestone Tire & Rubber Co.: Described an indicated future trend toward landing gears comprised of interchangeable eight-wheel articulated undercarriage units which retract into space between the floor beams in the fuselage of airplanes in the 200,000- to 300,000-pound category. Air was said to be the ideal elastic support for the plane while taxiing, with rubber a close second. Oil was viewed as a nearly ideal medium for absorbing the energy and heat of landing impact. Rubber springs were described as meriting serious consideration, with combinations of oil, and rubber discs vulcanized to metallic discs, offering many advantages.

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ing specified on his rating record, he may supervise any major repair, overhaul, or alteration of an airframe and its appliances, but may not return an aircraft to service after such major repair, overhaul, or alteration;

(d) *Airframe repair and overhaul, 1st class.* Within the light or heavy airframe rating specified on his rating record, in addition to the privileges specified in paragraph (c), he may return an aircraft to service after such major repair, overhaul, or alteration if no other portion of the aircraft is involved;

(e) *Engine repair and overhaul, 2d class.* Within the light or heavy engine rating specified on his rating record, he may supervise any major repair, overhaul, or alteration of an engine and its appliances, but may not return an aircraft to service after such major repair, overhaul, or alteration;

(f) *Engine repair and overhaul, 1st class.* Within the light or heavy engine rating specified on his rating record, in addition to the privileges specified in paragraph (e), he may return an aircraft to service after such major repair or alteration if no other portion of the aircraft is involved;

(g) *Propeller.* He may supervise any major repair, overhaul, or alteration of a propeller and may return an aircraft to service thereafter if no other portion of the aircraft is involved;

(h) *Radio.* He may supervise any major repair, overhaul, or alteration of a radio and may return an aircraft to service thereafter if no other portion of the aircraft is involved;

(i) *Instrument.* He may supervise any major repair, overhaul, or alteration of an instrument and may return an aircraft to service thereafter if no other portion of the aircraft is involved.

24.31 *General limitations.* A certificated mechanic when serving as such must have in his possession his mechanic certificate, rating record, and an identification card satisfactory to the Administrator, containing his fingerprints, his picture, and his signature.

24.310 *Service limitations.* A mechanic may perform duties and assume responsibilities as a certificated mechanic only if he is competent by reason of previous experience with, or knowledge of, the particular operation and only if such work is done in accordance with the manufacturer's specifications or the approved Manuals of the Administrator and the details of such work are recorded as prescribed by the Administrator.

24.311 *Recent experience.* The holder of a mechanic certificate may exercise the privileges thereunder only if, within the preceding 24 calendar months, he has:

(a) served as a mechanic for at least six months, or

(b) demonstrated to the Administrator that he is able to meet the standards prescribed for the issuance of the certificate and ratings.

24.4 Miscellaneous Rules

24.40 *Military competence.* An applicant who is, or was within six months preceding application, an active member of the Army, Navy, Marine Corps, or Coast Guard on duty involving regular service as a rated mechanic or specialist technician for a period of not less than one year, upon satisfactory accomplishment of the prescribed written examination on the Civil Air Regulations and presentation of a statement from the appropriate military authorities attesting such rating and experience will be deemed to have met the requirements for issuance of a mechanic certificate with ratings appropriate to his military rating and experience.

24.41 *Existing certificates.* A currently effective mechanic certificate will continue in effect for a period not to exceed eighteen months after the effective date of this Part, during which time the holder may, upon application, be issued a mechanic certificate and the appropriate ratings provided for in this Part.

24.42 *Reports and records required.* A certificated mechanic must make such entries in aircraft and engine log-books and Aircraft Operations Records and must make such reports and keep such records as may be prescribed by the Administrator.

24.43 *Change of address.* A certificated mechanic must within thirty days after a change of address inform the Administrator in writing of his new address. In lieu of this requirement he may appoint an agent authorized to accept service of all notices and documents of which service is required under the Civil Aeronautics Act of 1938 and notify the Administrator of the name and address of such agent.

24.5 Definitions

24.50 The following definitions will apply to this Part of the Civil Air Regulations:

24.500 *Light aircraft.* A light aircraft is an aircraft of 5,000 pounds, or less, maximum authorized weight.

24.501 *Light airframe.* A light airframe is a light aircraft less powerplant.

24.502 *Heavy aircraft.* A heavy aircraft is an aircraft of more than 5,000 pounds maximum authorized weight.

24.503 *Heavy airframe.* A heavy airframe is a heavy aircraft less powerplant.

24.504 *Light engine.* A light engine is an aircraft engine of 500 horsepower or less.

24.505 *Heavy engine.* A heavy engine is an aircraft engine of more than 500 horsepower.

24.506 *Maintenance, service, repair, overhaul, and alteration.*

Maintenance, service, repair, overhaul, and alteration are defined in Manual 18. ★ ★ ★

the Martin Mars means *Payload!*

World's greatest airmail load, these 25,000 pounds of mail were carried from Hawaii to California by the mighty Martin Mars a total of 62,500,000 pound miles for a single non-stop flight. At an average of ½ ounce per letter, that's 800,000 letters . . . and if they were all paid for at prevailing rates, they would carry $160,000 in postage.

This load not only smashed all previous records for airmail, but more than doubled the 23,750,800 pound miles traveled with the all-time cargo record of 35,000 pounds which the Mars carried from Belem, Brazil to Trinidad on its first war mission for the Naval Air Transport Service.

Thus in payload, as in economy of operation, the Mars far outstrips all rivals. And her 20 sisterships, now being built by Martin, will offer even greater payload, lower ton-mile costs, and higher speed. Best of all, war's end will find Martin production lines fully tooled and manned by experienced workers to assure early delivery of commercial versions of the Mars. It's no wonder the Martin Mars is known as "the answer to an airline's prayer!"

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The Glenn L. Martin-Nebraska Company—Omaha

Martin
AIRCRAFT
Builders of Dependable Aircraft Since 1909

SKY'S THE LIMIT

(Continued from page 76)

at the worst possible time, we like two receivers.

So now we have at least a 2,000-pound airplane — fully loaded — and maybe it weighs 3,000 pounds. At $3.00 a pound minimum, we have $6,000 to $10,000 in it before we get started. Now, if these designers could give us this ship, all complete, for $5,000, it would be something. But if many people are to buy it, it's got to sell lower than that by at least $1,000 and maybe $2,000. Looks like the designers are going to have to use up a lot of pencils and paper before we get it.

In passing, we might say that the most useful all-around airplane we have ever owned was a 330 Jacobs Beechcraft. It had an automatic Learadio Compass, all the instruments, plenty of gas capacity, would get out of as short a field as anything we ever saw, didn't use too much gas, ambled along at a good 155 to 160 with no load on the engine (60 per cent rated hp.), would haul five people with some baggage, was wide and comfortable, and we once landed it on the ramp at Tallahassee when the rest of the field had red flags all over it. Of course, it wasn't the most economical airplane in the world when there was only one person aboard — we think that prize would go to Culver — but it was a pleasure to own and fly it. If we could get that same satisfaction, comfort and utility out of something for one-third the money (it cost almost $18,000 with all the stuff in it) we would think the millennium had arrived. ★ ★ ★

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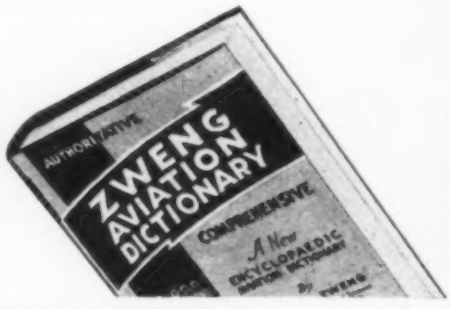

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BOOK REVIEWS

Astronomical Air Navigation, *by Squadron-Leader Ronald Hadingham, R. A. F. O., published by Thomas Y. Crowell Company, 432 Fourth Ave., New York 16, N. Y., price* $2.50.

Written for practical navigators, the purpose of this book is to provide a complete course in Astro-Navigation with only essential references to the mathematical and theoretical aspect. Basic principles have been included, however, together with a certain amount of elementary astronomy which will help the navigator to appreciate the nature of the heavenly bodies and their movements.

Gliding and Soaring, *by John Paul Andrews, published by Robert McBride & Company, 116 East 16th St., New York 3, N. Y., price* $2.75.

The author has conceived of his book as a practical approach to gliding in all its phases. A short course in simple aerodynamics is included.

A whole section is included on gliding clubs and how schools can operate them for their sports and educational value. The legal aspects of joint ownership of gliders and airplanes are also explained.

NEW LITERATURE

Airplane Manufacturing & Supply Corp., *Manufacturing Division, 6853 Lankershim Blvd., North Hollywood, Calif.,* has issued a new twenty-eight-page Catalog "T" —Aircraft Test and Service Equipment. Necessary equipment available for the Fixed Base Operator, Airline overhaul stations and Airfield service bases is clearly described and illustrated. Free when requested on firm letterhead. Address inquiries to Nelson Mabery.

The Industrial Bureau of the Atlanta Chamber of Commerce has announced publication of the new 1944 edition of "Facts in Figures about Atlanta" for reference purposes. Free copies are available to SOUTHERN FLIGHT readers on request to Frank K. Shaw, Industrial Engineer.

The Brass Forging Association, *420 Lexington Ave., New York* has announced publication of a new bulletin, Non-Ferrous Forgings Digest. It will be issued periodically and anyone desiring to be placed on the mailing list for the inaugural issue dated October and subsequent copies can do so by writing to the Association.

The B. F. Goodrich Company, *Akron, Ohio,* has issued a two-page leaflet on the "Property Relation of Natural and Synthetic Rubber," available on request.

Walter Kidde & Company, *New York 6, N. Y.,* have made up sets of three decalcomanias for first-aid fire extinguishers which can be transferred to the extinguisher itself or to the wall behind its station. These decals indicate briefly and clearly the fires for which that particular unit is suitable, and those on which it should not be used.

A limited number of sets will be supplied free on request, and larger quantities may be had for a nominal charge.

Chemaco Corporation, *Berkley, Hts., N. J.,* has issued an illustrated folder covering Polystyrene Moulding Material for injection and extrusion. Physical properties as well as a list of suggested applications and typical uses of Chemaco Polystyrene are given.

Boeing B-29 Superfortress in Flight

Size alone wasn't enough

The Army wanted an airplane that would carry a *heavier bomb load . . . farther, faster* and *higher* . . . than any had before.

Size alone wasn't enough. There were already single, experimental models of massive airplanes; but they lacked the required speed and altitude.

There were also high-performance airplanes. But these were small, lacked long-range and load-carrying ability.

The problem of combining both extremes in one airplane was put before America's aircraft industry. One company, Boeing, was in an exceptional position to meet the Army's requirements, because of its background of pioneering work in developing such four-engine airplanes as the B-17 Flying Fortress, the B-15 Bomber, the Stratoliner and the Pan American Clippers.

The Boeing design was accepted. And then, even before the first experimental model had been completed and tested, the Army committed the Boeing Superfortress to one of the greatest manufacturing programs ever placed behind any weapon of war!

Seldom has such engineering and production responsibility been given to *any* organization. It meant that the new plane *had* to be right; that no basic design changes could be made. It meant that Boeing had to work out the manufacturing plan of the B-29 at the same time it was completing the engineering design—and had to furnish full information about both to the companies which had been selected to help build it.

Success in planning and executing every step of the entire Superfortress program was imperative because of the important military plans built around it. Following the first B-29 operation, the Secretary of War said: "The new long-range bombers have overcome the tremendous barriers of distance to bring the heart of Japan under the guns and bombs of the Army Air Force."

When peace finally comes, Boeing principles of research, design, engineering and manufacture will again be applied to products for your use. True now, it will be equally true of any peacetime product . . . if it's "Built by Boeing" it's bound to be good.

DESIGNERS OF THE FLYING FORTRESS • THE NEW B-29 SUPERFORTRESS • THE STRATOLINER • PAN AMERICAN CLIPPERS **BOEING**

Plane Output May Show Rise; 25,000 Heavy Bombers Delivered

Aircraft output during October was expected to pass September's total of 7,593 planes, with deliveries running smoothly and at a more stabilized rate.

Meanwhile, WPB Chairman J. A. Krug said war production in general was lagging, pointing out the B-29 is "still behind schedule," with modifications being made almost weekly. Real production of B-32's will not appear until next year, although the Dominator is already in production on a limited scale.

A total of 240,000 warplanes have been manufactured in the U. S. so far, he said, and 25,000 of them were four-engine bombers.

WPB also announced that airframe weight now averages 10,300 pounds as compared with an average weight of only 3,020 pounds in 1940, when emphasis was on trainers and fighters. By December of 1944 the average weight is expected by WPB to reach 10,500 pounds.

Aircraft War Production Councils on East and West Coasts will continue operations until after victory in Europe and probably well into the duration of the Pacific war.

New Fighters, Bombers Designed by North American

North American Aviation, Inc., now holds contracts for 17,000 warplanes, including more than 500 fighters of two new secret types, and its engineers are designing new fighters said to be 30 per cent faster than current models and new bombers described as being 50 per cent faster than existing types.

President J. H. Kindelberger, who revealed the new planes in a stockholders' meeting last month, said the firm has reduced average costs on the P-51 Mustang by over 18.5 per cent, and has reduced the cost of the B-25 Mitchell by 26.5 per cent, since Jan. 1.

P-51, B-24 and AT-6 output by the Dallas Division each month in 1944 has been in excess of the largest number of planes the government ever received in one month from any other single manufacturing operation, he said. NAA was said to be the first firm to produce 30,000 military planes of five different types since Sept. 1, 1939.

Ranger Announces New 700-hp. Engine Type

Intended to meet requirements of postwar commercial operations, particularly those of feeder airlines, a new aircooled inline Ranger engine developing 700 hp. for takeoff, was announced last month by Fairchild Engine and Airplane Corp. Its weight, together with standard accessories, was said to be only 870 pounds. A twelve-cylinder inverted "V" type, it is 74.92 inches long, 33.28 inches wide and 31.11 inches high and is said to develop almost one horsepower per cubic inch of displacement, using 100 octane gasoline.

Allison to Build AAF Jet Propulsion Engines

Jet propulsion units for the Army Air Corps will be made by Allison, E. B. Newill, General Manager of Allison Division of General Motors, announced last month. This new production assignment is in addition to the V-1710 liquid-cooled engines, 60,000 of which have been built since the start of the war.

According to the announcement, the production of the first units will begin shortly after the first of the year. This unit has been approved for production by the Air Technical Service Command Power Section, and will be capable of powering Army jet propelled planes at very high speeds. Seventeen specially designed test cells and additions to two departments will be built to provide necessary new facilities.

Allison is the first U. S. producer of reciprocating engines to announce jet engine production.

NAA Shifts P-51 Service Orders to Dallas

Service Orders, consisting of parts needed in emergency cases for P-51 Mustangs out of commission in this country or in the war zones, have been added to the production of North American Aviation's Dallas plant. Production of these Service Orders was transferred from the Inglewood, Calif., plant partly to fill the gap left by cut-backs in B-24 production.

The Service Orders are in addition to the normal contract spares furnished through regular production.

John C. Lee Elected President of Menasco

John C. Lee

John C. Lee, manager of the Aircraft War Production Council since its beginning in April, 1942, has succeeded John E. Royall, who resigned because of ill health, as president of the Menasco Manufacturing Co., Los Angeles.

Menasco is a major hydraulic landing gear manufacturer, producing landing gear struts for P-51, P-47 and P-38 fighter planes. The company is also engaged in experimental work for the Army and Navy. Special processes and equipment have been developed, and a metallurgical and research testing laboratory has been installed to aid in controlling quality and in carrying forward experimental and development work.

Lee will retain his interest in the public relations firm of Lee & Losh, consultants for many companies and the Aeronautical Chamber of Commerce.

$40,000,000-Contract for Navy Planes to Ryan; Will Expand Employment

Ryan Aeronautical Company, San Diego, has received from the Navy a contract for over $40,000,000 worth of combat aircraft, bringing Ryan's backlog to an all-time high of $70,000,000.

The new Navy contract is expected to carry heavy manufacturing operations well into 1946. Employment must be increased about 35 per cent according to expectations at present.

The Defense Plant Corporation has recently announced authorization for additional equipment at the factory to cost approximately $300,000.

Shortly after revealing receipt of the large Navy order for fighters, Ryan Aeronautical Company announced appointment of Omer L. Woodson, former vice president of Bell Aircraft Corporation in charge of the B-29 factory in Georgia, as vice president and general manager.

50,000 Cyclone Engines Built in 3½ Years by Wright in Ohio

Wright Aeronautical Corporation has delivered the 50,000th Wright Cyclone engine to be manufactured in the plant at Lockland, Ohio, during its three and one-half years operation. More than 40 per cent of that number were built in 1944.

The big factory has turned out, in spare parts and completed engines, the equivalent of about 100,000,000 horsepower, producing in July and August more total engine horsepower than any other aircraft engine plant in the nation.

U. S. Co-operation in Engine Design and Procurement Needed

Problems concerning the technical aspects of military aircraft engine procurement were discussed when members of the Engine Technical Committee of the Aeronautical Chamber of Commerce, who are the chief engineers and vice presidents of the country's aircraft engine companies, and policy-determining military officials met in Washington last month.

The need for government-industry collaboration of technical requirements for designing and buying engines was stressed at the meeting. Determination of the contractors' responsibility under varying provisions of changing technical requirements was discussed.

E. E. Wilson Predicts U. S. Airlines to Operate Routes Established by Army, Navy

New world trade areas and expanding foreign commerce because of the development of the air transportation industry were foreseen by Eugene E. Wilson, vice chairman of United Aircraft Corporation, in an address before the National Foreign Trade Council last month in New York. He pointed out that peace will be lasting only if air power is maintained during the years to come.

Wilson predicted U. S. airlines will operate world routes established by the Army and Navy.

Aircraft Standards and Specifications for Electrical Equipment Being Prepared

A program for the preparation of standards, specifications and test codes that will adapt aircraft electrical equipment and systems for operational requirements has been undertaken jointly by Aircraft War Production Council, American Institute of Electrical Engineers, National Aircraft Standards Committee, National Electric Manufacturers Association and the Society of Automotive Engineers at the request of the Army Air Forces Air Technical Service Command.

A joint statement says the purposes of the program are to enable industry to establish satisfactory design, test, and performance standards which will eliminate need for and cost of subsequent service or environmental tests, and to lay the basis for future Army-Navy specifications.

Ken Ellington Heads ACCA's N. Y. Office; Wiggin Aids Russell

Ken Ellington, well known secretary of the Aircraft War Production Council, East Coast, Inc., and for the last three months consultant to Hill and Knowlton, public relations counsel, has been appointed manager of the New York office of the Aircraft Manufacturers Council of the Aeronautical Chamber of Commerce.

Scott Russell, general manager of ACCA, also announced appointment of G. O. Wiggin as assistant general manager of the Chamber. He had been executive engineer of Ranger Aircraft Engine Division.

Sea Wolf Torpedo Plane Production Announced

A new torpedo bomber, the TBY-2 "Sea Wolf," is now being produced by the Allentown, Pa., plant of the Consolidated Vultee Aircraft Corporation. The plane, designed by Chance Vought Aircraft, weighs eight tons and carries a crew of four persons, including the pilot, gunner, radio-man and bomber. Machine guns, torpedoes and bombs are the major armament of the plane.

Incentive Tax Plan Urged to Expand Production

Incentive for expanded production of new products in the postwar era by a new tax program was urged last month by A. A. Kucher, director of research for the Bendix Aviation Corp., in an address to the Committee for Economic Development.

Kucher said that the present income taxes discourage individuals and corporations from financing long-term "risks" development of new products. He proposed a three-year, "tax-free incentive" period.

First P-38 Empennage Made by Miami Division

The Miami division of Consolidated Vultee Aircraft Corporation last month completed its first P-38 tail assembly, and the assemblies are now rolling off the line regularly. Final assembly is done at Consolidated Vultee's Nashville division.

Besides this new empennage, the Miami division's manufacturing program includes five assembly projects for the B-24, the PBY, the F4G-1, Corsair, and a restricted torpedo bomber.

B-29's Cost Down to $600,000; First Product Cost $3,392,396.90

The first B-29 Superfortress cost $3,392,396.90 which included all of the preliminary engineering, experiments, tests, and changes. Production cost at present is down to about $600,000.

The original contract was for $1,674,880. This did not include government-furnished equipment costing approximately $493,300. Tests that finally proved the necessity for altering the tail cost $95,241. Other tests included $72,500 for enlarging the bomb bay, $15,600 for new propeller tests. Other incidental changes ran the total test-changes up another $94,897.90.

Original wind-tunnel static tests that were continued to destruction on the first model cost $861,828.

Kansas Delivers 5,000th B-25; Monthly Output Rate Passes 263 Mark

By the end of September, North American Aviation's Kansas City plant had produced more than 5,000 B-25 Mitchell bombers. The monthly rate of output for 1944 has increased 66 per cent over 1943. During 1943 the monthly average was 141.8 B-25's; through September of this year the rate has been 263.3.

With the increased production, cost to the government has dropped 26.5 per cent. A total of over 73,000,000 man-hours have been devoted to production in the last two years. Employe output has reached about six pounds per day.

Delivery of 10,000th B-17 Spotlights Pool

Delivery last month of the 10,000th Boeing Flying Fortress since Pearl Harbor was revealed as evidence of the aircraft industry's success with its "production pool," in which Boeing designed the B-17 in 1935 and then was joined in 1941 in its quantity production by Douglas and Lockheed. The Aircraft War Production Council pointed out that B-17 No. 9,999 came from Douglas at Long Beach, Calif., No. 10,000 from Boeing in Seattle, and No. 10,001 from Lockheed in Burbank. Boeing has built 6,143, Douglas 1,982 and Lockheed 1,876. The B-17 pool has been so successful its general outline is being followed in operating the new B-29 "pool," in which Boeing is joined by other firms.

New Construction Contracts for Fort Worth Plant

New facilities at Consolidated Vultee Aircraft Corporation's Fort Worth division are continuing with the announcement last month of two new contracts for construction and paving work. One new contract called for the relocation of foundations for two Verson presses in the sheet metal department at a cost of $5,200, and the Texas Bitulithic Company was awarded a $136,000 contract for the paving of areas around two new service buildings.

B-29 Program Upped By 700 Planes at Wichita

An additional order for more B-29s has been placed with Wichita division of Boeing Aircraft Company. The order, fourth in a series for the building of the Superfortresses, calls for 700 more B-29s.

Duramold Moves from N. Y. to Burlington, N. C.

Operations of the Duramold Division of Fairchild Engine and Airplane Corporation are being moved from New York to Burlington, N. C., to begin immediate production of "undisclosed Air Forces materiel", J. Carlton Ward, Jr., president of Fairchild, announced last month. The Burlington plant will be under the supervision of T. Kelly Pierce, assistant general manager.

The Duramold process had been used in Burlington for the production of twin-engine AT-21 trainers until cutbacks cancelled the production.

New System Saves Labor at Nashville

A Cost Improvement Program, under which salaried personnel submit proposals for safer and better methods of doing jobs, has been instituted by the Nashville Division of Consolidated Vultee Aircraft Corporation. About 425,000 man-hours are saved annually by this system.

The C. I. P. differs from the Suggestion Program, which is for the benefit of hourly employes, in that the salaried workers are not paid for the proposals they recommend, if accepted. The hourly employes are paid a certain percentage of the amount saved through the adoption of a recommendation in the Suggestion Program.

Dallas Firm to Represent Young Radiator Co.

Rodgers Engineering Company of Dallas has been appointed sales representative of the Young Radiator Company, Racine, Wisconsin. Service will be provided for all Young heating, cooling and air conditioning products as well as a complete line of complementary accessories.

AAF Instruments Lab Insures Accuracy for Industry

The Air Technical Service Command at Wright Field, Ohio, has developed an Instrument Laboratory that has the world's most accurate and finest equipment in the tool, gage and instrument industry.

The laboratory's principal duty is to insure the procurement of instruments with high degree of accuracy under all conditions, constant check being kept on the 125 different types of instruments subject to AAF inspection. This laboratory can measure to an accuracy of .000002 of an inch.

It is under direction of Col. Bryant L. Boatner.

Firestone Producing Aircraft Rocket Tubes

Rocket launching tubes for planes are now being mass-produced by the Firestone Tire and Rubber Company in Akron, Ohio. The rocket tubes are placed under the wings of aircraft in clusters of three for each wing. The launchers are made of plastic-hardened paper and also of magnesium, a complete launcher weighing only eighty-five pounds, maximum. Projectiles are discharged electrically, each tube firing only one rocket shell before reloading is necessary. The launchers are built adjustable to fit P-38, P-39, A-20, and A-36 planes.

GE to Make Plastic Plane Parts on West Coast

General Electric has announced plans to purchase a twelve-acre site in Anaheim, California, for the postwar manufacture of plastic parts for aircraft. Details of the proposed factory and the parts it will produce for planes were not given.

New Fire Extinguishing System for Aircraft

Savings of over 50 per cent in weight with more efficient protection at extreme temperatures and economy of installation costs are claimed for American-LaFrance-Foamite Corporation's new Broamite system for aircraft fire-extinguishing systems.

Making use of methyl-bromide, the electrically-operated system meets requirements of CAA and AAF. It is designed to accomodate any number of motors. There is a standby battery of cylinders for additional protection.

WITTEK
AVIATION HOSE CLAMPS
Standard Equipment on
BOEING B-17 FLYING FORTRESS

Since the beginning of modern aviation Wittek Hose Clamps have been known as the standard of the industry. Today they are being used by the nation's leading military aircraft and engine builders.

ARMY NAVY

WITTEK Aviation HOSE CLAMPS

San Diego Firms and Individuals Donate $164,800 for IAS Aero Center

Consolidated Vultee, Rohr Aircraft, Solar Aircraft, Ryan Aeronautical, Langley Corporation, and individuals have together contributed $164,800 to the Institute of Aeronautical Sciences for facilities at San Diego where members of the Institute can hold technical meetings, fraternize and have adequate library facilities. A building will be constructed with the funds, and will be located at the new airport center now under construction. Maj. R. H. Fleet, Institute president, expressed hope other aeronautical centers will be similarly endowed and established.

Luminous-Coated Plates for Template Production

Republic Aviation Corporation has been using a new method of transferring engineering drawings into templates and similar tooling devices by a photographic printing method. The original engineering drawing is scribed onto a metal or plastic plate coated with luminous paint. Lines through an opaque layer permit the luminous coating to show through. This is then placed in contact with the template or metal to be marked which has been coated with sensitized material.

Bubble Cockpit Process

Du Pont announces an improved method of producing Lucite teardrop cockpit enclosures. The plastic is heated in ovens until flexible, then drawn in a vacuum die which eliminates contact of plastic and former moulding dies. The new method eliminates distortion and speeds up production rates.

New Rivetscope

A rivetscope of greater length than previously believed possible is being used by Glenn L. Martin Co. The new 110-inch instrument was developed by the Lenox Instrument Company to check blind rivets in a new type wing construction, thereby saving costs and man-hours over the X-ray method previously in use.

Tool Design Service

Sheffield Corporation, Dayton, Ohio, makers of precision machine tools and instruments, has announced a tool designing service for aircraft and associated industries. A staff of tooling engineers has been assembled to offer valuable consultation of problems affecting quality and quantity production.

Magneto Film Available

To help speed up instruction in servicing and repairing Scintilla Aircraft Magnetos, the Jam Handy Organization, Detroit, has produced a series of seventeen discussional type slidefilms. Material is available through Scintilla, Sidney, N. Y.

Racks Expedite Anodizing

Employes of the Finishing and Plating Department of the Glenn L. Martin Company, Baltimore, have developed a rack method of holding tubing, extrusions, formed parts and heavy gauge flat stock for anodizing. The racks save nearly 50 per cent of the time formerly required by using the old style of spring hangers. Saving in electric current and fuller utilization of anodizing tanks have also resulted.

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NEW PRODUCTS

Radiophone Used in Factory

"Handie Talkie," a new two-way portable radio telephone unit manufactured by Motorola, proved its emergency value recently during a fire at an aircraft factory. Essential communication between plant and outside officials, or pedestrian conversations in the plant, necessary because regular lines of communication were disrupted, were continued without difficulty by use of the Handie Talkie. Said to send conversations clearly and distinctly, the unit relayed conversations to an outside exchange thence to a regular telephone exchange and eliminated total loss of outside communications.

Portable Engine Heater

An aircraft engine pre-heater, weighing 45 pounds, has been announced by Hunter and Company of Cleveland. The new heater was designed to hang on the propeller of a radial engine and is equipped with a canvas hood to enclose the engine and short connecting ducts for hot and return air. By recirculating air within the enclosure, covering all engine parts, the entire output of the heater is concentrated and, due to short travel, a minimum of heat is said to be lost through ducts and connections. The heater can be used for preheating aircraft cabins, small offices or shops, or for sending a flow of warm air toward mechanics working in an unheated area. The heater is a direct-gasoline-fire type made of a welded steel burner using a sealed flame; it has a small blower which drives the heated air, a built-in fuel tank, and controls centered on a panel. Ducts and hoods are made to fit all sizes and types of radial engine installations, the company said.

Tail Wheel Connector Spring

The Scott Aviation Corporation announces a new type of universal connector spring for steerable tail wheel assemblies. Adjustable in length to fit all makes of airplanes, it incorporates a universal joint said to eliminate breakage of spring tips. Light in weight, the adjustable feature also enables the user to secure the correct tension for proper steering action, according to the company. The patented spring provides a locked connection at one end to prevent its loss when operating on rough fields.

De-Icer Uses Nylon Tubes

An improved de-icer, known as Type 11, has been revealed by the B. F. Goodrich Company, Akron. The new de-icer will remove ice from airplanes while in flight, and is said to have an improved tear resistance, Nylon tubes, longer life and reduced maintenance. The tear resistance is obtained by an all over ply of elastic fabric. Highly stretchable Nylon fabric is used in the tubes, which pulsate while the de-icer operates, and the tubes are recessed into the de-icer to produce a smooth, uniform cross section.

United-Carr Named Nigg Stud Sales Representative

With the announcement that the Nigg stud has been approved for use on both Army and Navy aircraft is the appointment of United-Carr Fastener Corp. as exclusive sales representatives for the Nigg Universal Adjustable Fastener Stud in all states except the west coast.

Hydro-Press Pads Reused

By grinding the worn part from a hydro-press pad, and vulcanizing a layer of rubber to each side, the life of the pad has been doubled, officials of the Ryan Aeronautical Company, San Diego, revealed. A hydro-press pad is used under a hydro-press ram, which forms parts under hundreds of tons of pressure, and is six inches thick, weighing several hundred pounds. This valuable salvage of a rubber product was suggested by R. W. Booth, Sr., in the drop hammer department of Ryan, and was adopted by the company.

The new Universal stud is adjustable to all sheet thicknesses from .021 inch to .500 inch.

This "PORKCHOP" DRILLING ATTACHMENT

...makes awkward drilling easy

Here's a real "expediter" for aircraft construction. The handy design of the Terry Attachment No. 70, with 45° angle of the drill shaft, enables the operator to speed up drilling in difficult spots. Operation of this popular Terry Tool is smooth, quiet. Positive, comfortable grip; fully guarded. Heavy-duty body is made of bearing bronze, with renewable bronze spindle bearing. Gears are heat treated alloy steel, accurately machined. All parts are standardized, making replacements easy. New catalog on Terry Tools on request. In writing, please use company letterhead and indicate your title.

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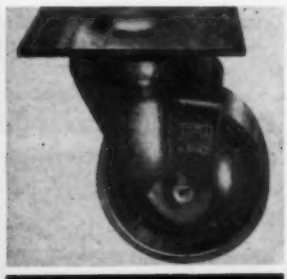

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AIR TRANSPORT

300-mph., 108-Passenger Super Clippers Ordered by PAA from Douglas

A prototype of the DC-7, of which Pan American World Airways has announced orders for twenty-six, is under construction at Douglas Aircraft's Long Beach plant.

The 108-passenger, plus thirteen-crew, "Super-Clipper" is expected to be capable of cruising in excess of 300 miles per hour. Costing a million and a half dollars, it will have two pressurized cabins of seventy-two- and thirty-six-passenger capacity. Power plants will be four Pratt and Whitney engines of even greater displacement than the 2100-horsepower Double Wasps. Super-hydromatic Hamilton Standard propellers will be used.

Pan American plans use of the planes in Latin American service that would permit such schedules as twenty-two hours from New York to Buenos Aires.

AAF Flies 23,000 Tons Monthly Over "the Hump"

More than 46,000,000 pounds of military cargo were flown across "the Hump" from India into China in a recent month, according to the War Department. On one day 569 individual flights, one every two and one-half minutes for twenty-four hours, carried in 1,300 tons.

Accelerated operations have resulted from doubling the number of transports, greater maintenance and repair efficiency, faster ground handling of cargo, and increased numbers of airports. A crew chief of one C-46 kept his plane flying for twenty-seven days out of the month, the other four being given over to required 100-hour checks. The present washout record is less than one-half of one per cent per thousand hours flown.

Wirebound Boxes Effect Air Freight Savings

Results of tests by manufacturers of wirebound boxes indicate large potential savings for packaging air freight shipments. A recent test of a wirebound box and a conventional nailed wooden box for shipping ten five-pint bottles of acid assertedly showed identical strength and safety attributes, but the wirebound box weighed only nineteen pounds against twenty eight for the conventional box. Costs were 35 cents for the wirebound box, $1.37 for the nailed wood. On an air express shipment from Chicago to Pittsburgh, for example, the wirebound container would save $2.30 in original cost and shipping charges. This would amount to 23 cents per bottle of acid.

Wirebound Box Manufacturers Association reports that these boxes can be built to ship anything from miscellaneous parts to large refrigerators. Sixty-six plants service all parts of the country. Last year 125,000,000 wirebound boxes and crates were produced.

Ball and Parrish Top TWA Writers Competition

TWA has announced winners in their annual Aviation Writing and Photographic Competition. Robert Ball, aviation editor of the Detroit News, was winner in the newspaper, open class division. William W. Dyviniak of the Buffalo Courier-Express was photographic winner. Other awards were made to Wayne Parrish of Liberty Magazine, Nick Moser, J. Howard Cutler, Dan K. Park and Robert R. Gebhart, Jr., all of the Reading (Pa.) Eagle-Times, Reginald Cleveland of the New York Times, Robert H. Helmer of the Cincinnati Enquirer, E. J. Foley and Eric Bramley of American Aviation, James N. Keen of the Dayton Journal-Herald, and Francis S. Murphy of the Hartford Times.

FAIRCHILD'S TWIN-BOOMED C-82, flight-tested last month, is in the 50,000 pound class with a 3,500-mile range. Two 2,100-horsepower Pratt & Whitney R-2800 engines furnish the power. Wingspread is given as 106 feet. Rear section of fuselage opens for loading and floor of ship is at truck platform height. Fuselage interior is square. This is said to be the first airplane designed from drawing board up solely for hauling heavy military cargo.

—(Fairchild Aircraft Photo.)

Transport Speakers Listed

The annual Air Transport Engineering meeting of the Society of Automotive Engineers will be held in Kansas City, November 16 and 17. Speakers will include P. D. Doran of Pratt & Whitney, W. J. Blanchard of General Motors, James Clyne and C. H. Cartledge of Douglas Aircraft, Howard Morgan of TWA, J. B. Rea of Consolidated Vultee, M. G. Beard of American Airlines, and Luther Hoffman of TWA. At the dinner meeting on November 16 William S. James, SAE president, will speak on "Transportation Horizons," and C. J. McCarthy, vice president of United Aircraft will speak on "Aircraft Manufacture and Air Transportation."

International

Douglas C-54s of the Air Transport Command are now being used for transatlantic air evacuation of combat casualties from the European theatre to the United States at a rate of 4,000 casualties a month, representing about 40 per cent of all casualties returning from overseas. From D-Day through September 55,000 patients were evacuated from France to England by C-47s of the Troop Carrier Command. Although only the most critical cases were given air priority, the death rate of air-evacuated patients after admission to hospitals in England has been only fourt-tenths of one per cent. Within the United States the Ferrying Division of the ATC is flying 6,000 patients a month from American ports of debarkation to hospitals in the interior. This includes a portion of those arriving by sea as well as those coming in by air. . . . Direct service from the United States to Paris has been inaugurated by the Air Transport Command for the transport of personnel, supplies, and mail. Regular service was started with the recent visit of General Marshall and staff. The first supply plane landed a few minutes later. . . . Pan American World Airways has filed with the Civil Aeronautics Board for permission to use Baltimore, Boston, Chicago, and Detroit as terminal points for international services of the company already held under permanent certificates.

A summary of military operations of American Airlines discloses that the company has flown 11,634,309 miles in transoceanic operations between August, 1943, and July, 1944. Current operations feature seven daily transatlantic crossings. . . . Two international airlines marked anniversaries in October. KLM Royal Dutch Airlines was twenty-five years old, having begun service between Amsterdam and London in 1919 and Pan American World Airways was seventeen, having opened its initial Key West-Havana operation in 1927.

Latest development regarding Pan American's "chosen instrument" theory of a single U. S. operated international airline was the report of a poll conducted by Modern Industry magazine which showed 91½ per cent opposed to the theory and favoring competition. The poll followed the presentation of both sides in articles appearing in the magazine.

Domestic

Although gross domestic airline revenue for the twelve months ending June 30, 1944, increased nearly $21,000,000 over the previous twelve months, *net* operating revenue was down over $3,000,000. Operating expenses per revenue-mile rose from 84 cents to 91 cents, while operating revenues per mile decreased from $1.19 to $1.15. Operating expenses rose from $82,861,400 to $107,167,735 and operating revenues were up from $113,324,489 to $134,300,583. Only revenue item to decrease was express and freight down from $8,429,353 to $7,721,503.

During the first two weeks of operation, National Airlines' new New York-to-Florida route has produced exceptionally high load factors. Southbound, the average was 98.92 per cent, while northbound the average was 97.31 per cent. Flying the route non-stop pending opening of stations at intermediate points, a new record of three hours and fifty minutes was set on October 12th, between New York and Jacksonville.

Delta Air Lines has published an attractive brochure advertising its rich Southern territory—for which the South is deeply grateful. . . . PCA will inaugurate service into Huntsville, Alabama, early in November. . . . Continental Air Lines was the last company to have its domestic ATC operations cancelled. Last contract flight was made on October 15th.

Air express shipments carried in combination air-rail express were up 10.9 per cent in August of this year over the same month in 1943.

Personals

VINCENT P. CONROY has resigned as vice president-traffic for TWA to become assistant to the president of the Delta Man-

(Continued on page 93)

PERSONALS

Gordon Klotz Mooberry Povey

MYRON B. GORDON has been elected a director and vice president in charge of operations of Fairchild Engine and Airplane Corporation. He was formerly vice president and general manager of Wright Aeronautical Corporation and a vice president of Curtiss-Wright Corporation.

LEOPOLD H. P. KLOTZ of Trenton and New York City has been elected vice president and treasurer of Luscombe Airplane Corporation. He has been a private pilot for over fifteen years.

HENRY E. MOOBERRY has been appointed assistant to the president of United Aircraft Corporation at the East Hartford offices. He was formerly assistant director of advertising and publicity for the company.

LEONARD J. (LEN) POVEY will be in charge of military aircraft sales for Fairchild Aircraft Division, Hagerstown, Maryland. Povey comes from his former position as vice president in charge of flight operations for Embry-Riddle School of Aviation.

Fairchild has also named LEE H. SMITH manager of personal aircraft sales. . . . Curtiss-Wright, Airplane Division, has moved N. F. VANDERLIPP from factory manager of the Columbus plant to general manager of Buffalo plant, with CHARLES W. FRANCE moving from Buffalo to the St. Louis plant as general manager. Other changes announced by Curtiss-Wright move BURTON H. WITHERSPOON from manager at St. Louis to Buffalo as director of Business research, replacing DR. DONALD H. DAVENPORT, who resigned.

J. HOWARD BLAKE is newly appointed to head market research for non-aeronautical products of Glenn L. Martin Company. He comes from similar work for N. W. Ayer & Son, Inc. . . . A. A. KUCHER, Bendix Aviation Corporation's director of research, has been elected a vice president of that company. . . . JOHN H. O'CONNELL is newly appointed manager of public relations for Curtiss-Wright's Propeller Division at Caldwell, N. J. . . . ROY CAMPBELL, JR., formerly manager of publications and art division of Lockheed Aircraft Corporation, has been named advertising manager of Lockheed.

Otto Airlines has named ALVIN EAGER as operations manager. . . . MELVIN M. MASON has been moved up from contracts administrator at the Nashville Division of Consolidated Vultee Aircraft Corporation to position of chief of contracts at that plant. . . . MAJOR CHARLES E. HARNER joins Hill and Knowlton after two years of Army service.

AAF Jet Engine Expert Presented Bane Award

For contributing to the utilization and development of the jet propulsion aircraft engine, Col. Donald J. Keirn has received the Thurman H. Bane Award for 1944, given annually for the most important technical achievement by an officer or civilian of the Air Technical Service Command, Wright Field, Ohio. The initial presentation of the award was made last year to Col. H. F. Gregory for his contribution to the development of the helicopter.

Memorial to O. R. Stocke

Friends of Otto R. Stocke, assistant to the division manager of the Nashville Division of Consolidated Vultee, who died October 1, are planning a Stocke Memorial Library of aeronautical textbooks to be donated to the Joint University Libraries in Nashville, Tenn.

AIR TRANSPORT

(Continued from page 92)

ufacturnig Co., makers of light power tools for industrial use. Conroy is a veteran of seventeen years in air transportation.

JAMES C. DeLONG has been appointed director of advertising for TWA. . . . DEWEY C. WAYNE has resigned as chief of OPA's Transportation Branch to become general manager of Aero-Transporters, S. A., Monterrey, Mexico.

MERREL BROCK, Braniff captain, completed twenty-five years as a pilot on October 10th. Texas-born, Brock has logged approximately 14,000 hours without injury to himself or passengers or damage to a plane. . . . GUY M. SPRINGER, JR., formerly assistant to the vice president-traffic of Braniff, has been appointed air mail and air cargo manager to head a new Air Cargo Division. . . . Braniff also announces the appointment of AL WOLFE as Employment Manager.

For Chicago and Southern Air Lines GEORGE F. SHEDD replaces B. T. CLINE who resigned as district traffic manager at St. Louis. . . . WILLIAM E. PARKER becomes New Orelans district traffic manager, replacing BURRELL WEBER. . . . NORMAN ANISHANSLIN has been promoted to revenue auditor; replacing him as Memphis district traffic manager will be LLOYD J. CALHOUN, formerly manager of C&S Continental engine overhaul, a war project.

ROSS FERRIER, formerly with Greyhound Bus, is newly appointed traffic representative for Delta Air Lines at Dallas, it was announced by ALLEN BIRMINGHAM, district traffic manager.

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CAA Expansion Mapped; Foreign Service Added

Administrator T. P. Wright last month charted "rearrangement" and expansion of the Civil Aeronautics Administration to meet requirements posed by the impetus given aviation during the war. The "rearrangement" is set forth in a chart showing CAA activities grouped in three main services: Administrative, operations and development. Within the latter are a new "aviation training service" and a new division charged with foreign operations. Al S. Koch, now assistant administrator, will head the foreign division, and Bruce Uthus is in charge of training service in which the civil pilot training program, manpower training, air education, training of foreign nationals and training research have been combined.

Wright said a program for future civil pilot training, together with cost estimates, is being prepared.

Wright Lists Details of Gas Ration System

Rationing of 73-80 octane aviation gasoline, instituted on November 1, is being conducted in accordance with the following system detailed by Civil Aeronautics Administrator T. P. Wright.

(1) All pilots, aviation enterprises, and private companies with fleets of planes will obtain allocation request forms from the CAA in Washington or CAA Regional Offices. They will apply for gasoline for the rest of this year, and quarterly thereafter on the basis of their purchase records in June, July and August, mailing the application to the Washington office of Civil Aeronautics Administration.

(2) The CAA at Washington will send them a ration check calling for the number of gallons to which they are entitled.

(3) They will deposit this check in the rationing system bank in their city and will receive a bank book by which they can draw against their balance in gasoline, exactly as a monetary bank account is handled.

(4) Oil companies will deliver gasoline to the dealer or bulk user only upon presentation of a signed check.

(5) The dealer may sell this gasoline in any quantity to any purchaser but he may deliver it only into the airplane tank or the tank of an airplane engine test stand.

(6) The dealer accounts for the gasoline he obtains on the usual report form ACA 1327 which he filed with the CAA in Washington.

No coupons and no reports are required from the individual pilot who may continue to fly as directed by the Administrator in his order of September 16, 1944.

Aircraft and Equipment Exhibits to Feature NATA-ADMA Convention in St. Louis, Dec. 5-9

An attendance of more than 1,000 has been definitely assured for the annual convention of the National Aviation Trades Association December 5 to 9 at St. Louis. Headquarters will be in the Hotel Jefferson. The convention will be held in conjunction with an exhibit by airplane manufacturers, and parts suppliers and distributors under the auspices of the NATA and the Aviation Distributors and Manufacturers Association, meeting in its second annual convention. More than 150 exhibits will be on display at convention headquarters.

An effort will be made at the St. Louis meeting to formulate a program of aviation legislation upon which general agreement among all divisions of non-scheduled civil aviation can be reached. President Roscoe Turner has pointed out the timeliness of the session in view of the new Congress which will convene in January, 1945.

In order to accommodate manufacturers who wish to demonstrate prototypes to distributors, dealers or agents of the manufacturers (no demonstrations to the public), arrangements have been made to conduct flights at small airports in the St. Louis area.

Among the principal speakers who have accepted important spots on the program are William A. M. Burden, assistant secretary of commerce for air; L. Welch Pogue, Civil Aeronautics Board chairman; J. Carlton Ward and Carl I. Friedlander, aircraft manufacturers; Thomas H. Beck, *Collier's* magazine; and William P. MacCracken, Jr., chairman of the civil aviation joint legislative committee.

The ADMA convention opens a day earlier than NATA's schedule. The equipment exhibit opens December 5 and closes December 9.

Aviation Clinic Program Announced

The 1944 National Aviation Clinic, sponsored jointly by the National Aeronautic Association and the State of Oklahoma, will get under way for a four-day session November 15. Clinic sessions will be held as last year in the State Capitol chamber of the house of representatives. The program follows:

WEDNESDAY, NOVEMBER 15 (Morning): Registration, Skirvin Towers Hotel; Luncheon, Gill Robb Wilson, speaker; subject: "The National Aviation Clinic—Retrospect and Prospect. (Afternoon) Opening Session: theme: Aviation and the Government. Speakers: Sheldon B. Steers, "The Rights of the State in Regulation of Aviation" and Dr. John H. Frederick, "The Case for Federal Regulation"; discussion leader, George E. Haddaway. Hon. Oswald Ryan, "Some Aspects of Aviation Taxation"; discussion leader, William P. MacCracken. Program Forum, Steadham Acker, director. Following adjournment official delegates will tour the new oil fields near Oklahoma City. 7:00 p. m., Gridiron barbecue.

THURSDAY, NOVEMBER 16 (Morning): Theme: The Role of the Personal Airplane in Tomorrow's America. Speakers: J. Carlton Ward, Jr., "Preview of the Postwar Personal Aircraft"; John E. P. Morgan, "The Utility of the Personal Airplane; Leslie Neville, "Personal Aircraft Markets"; William Mara, "Marketing Methods for Private Airplanes"; Discussion leader, Lowell H. Swenson. Luncheon, Lt. Col. William B. Harding, "The Disposition of War-born Surpluses, Facilities, Equipment and Materials." (Afternoon); Theme: Aviation's Crossroads and Highways—Airports and Traffic Control. Speakers: T. P. Wright, "The Federal Program for Airport Aid and Development"; Wm. L. Anderson, "Airports, Airparks and Airstrips—The Airport Pattern for Small Communities"; Charles S. Rhyne, "The Municipality—Its Airport Problems"; discussion leader, Alfred MacDonald. Glen A. Gilbert, "Developments in Communications and Air Traffic Control"; discussion leader, D. W. Rentzel. Following adjournment a tour, reception and buffet dinner will be provided by the Oklahoma City Air Service Command. At 7:30 p. m. a public session will be held at the municipal auditorium with the Oklahoma Wing, Civil Air Patrol, as hosts. Speaker will be the Hon. Fiorella H. LaGuardia.

FRIDAY, NOVEMBER 17 (morning): Theme: Travel and Trade by Air. Speakers: L. Welch Pogue, "Air Transportation's Postwar Passenger Potential"; discussion leader, E. Lee Talman. J. A. Wooten, "The Future of Air Freight"; discussion leader, Robert L. Smith. Luncheon, Maj. Gen. Harold L. George, "Air Transportation—Its Military Significance." (Afternoon): Speakers: Halsey R. Bazley, "Expansion of Feeder Airlines"; discussion leader, Joseph J. Mitchener, Jr., William R. Kent, "Tomorrow's Fixed-Base Operation"; discussion leader, Richard S. Robie. Program Committee will then present forum subject chosen from suggestions made at opening session. At 7:30 p. m. banquet in Silver Glade Room, Skirvin Towers, Gen. H. H. Arnold will speak on "Air Power."

SATURDAY, NOVEMBER 18 (morning): Theme: Training and Education in the Sciences and Arts of the Air. Speakers: C. S. Jones, "The Private Aviation Trade School"; Harold C. Hunt, "Aviation—Its Significance to Elementary and Secondary Schools"; M. K. Fahnestock, "Aviation Education and Research in Colleges and Universities"; Herbert C. Clish, "The Air Age—a Promise of New Worldwide Understanding"; discussion leader, Kenneth Newland. Luncheon, Brig. Gen. Frank T. Hines, "Aviation and the Returning Service Man."

Following adjournment after the noon luncheon, special tours have been arranged through war plants, aviation industries, oil fields, etc., visitors being allowed to select those trips which particularly interest them.

WNAA Convention Parallels Clinic

Members of the Women's National Aeronautic Association will hold their annual convention in Oklahoma City, Nov. 14-18 concurrently with the National Aviation Clinic, Nov. 15-18. The first day will be given to a luncheon for board members and a night meeting of the board. Registration will begin Nov. 15 at 9 a. m. on the mezzanine floor of the Biltmore Hotel. Mrs. Gordon L. Wright of Tulsa is president.

U. S. Delegation to Study British Aircraft Standards

Technicians representing the National Standards Committee and the Society of Automotive Engineers have left for England to study British aircraft standards and further co-ordinate British and American aircraft production. Those in the group were Eugene W. Norris, Aeronautical Chamber of Commerce of America; Eric Dudley, Curtiss-Wright Corporation, Airplane Division; Thomas P. Hearne, Ryan Aeronautical Corporation; James D. Redding, Society of Automotive Engineers; Gustaf Carvelli, Wright Aeronautical Corporation; Flight Lieutenant Douglas G. Moffitt, RAF, British Air Commission; L. D. Bonham, Lockheed Aircraft Corporation.

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Due to the paper shortage, thousands of CAP members have been unable to obtain copies of this Handbook in previous editions. Now the WPB has authorized SOUTHERN FLIGHT to print an additional 15,000 copies, and the new, revised edition will be off the press in November.

Orders are pouring in and 15,000 copies will not supply the demand. However, it is all we can print at this time. So we advise you to reserve your copy at once.

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Much interest was attracted at the Nebraska State Fair by this display exhibited by the Lincoln Squadron. Members who worked on the project included First Sgt. LuVerne Everett, Tech. Sgt. T. C. Winninger, Pvt. George Whiteford, Warrant Officer N. S. Hanson, Pvt. Dorothy Boettcher and Pvt. Virgil Reinke.

Air Corps Recruiting for 17-Yr.-Olds to End; 453,069 Win Wings

The current procurement objectives of the Army Air Forces air crew training program has been reached and recruiting of seventeen-year-old youths for the Air Corps Enlisted Reserve was to be suspended on October 31, the War Department announced.

With several thousands still in some stage of training, the AAF has announced that 453,069 men have won wings. Of this total 163,147 were commissioned as pilots, 31,293 became bombardiers, 31,906 became navigators and 226,723 graduated as aerial gunners. Those not qualifying for air crews were placed in AAF ground assignments. Men already in the ACER will be called to duty when needed, or when they are eighteen years and six months of age.

Cadets Solicit for Planes and Airport Needs

Funds for the purchase of three to five light Army training planes, strictly for the use of CAP Cadets, are being solicited by CAP Cadets in Wheeling, West Virginia. The Cadets are also soliciting funds to pay for repairs to the hangars, the building of a class or study room and a recreation room, and the installation of ladies' and men's rest rooms. The Cadets were authorized by R. L. Plummer, city manager of Wheeling, to solicit money for this airport project.

Norfolk, Neb., Airport Dedicated by CAP

A part of Civil Air Patrol efforts to develop aviation is shown by the step it took in the recent dedication of the airport at Norfolk, Nebraska. The CAP had complete charge of operations for the dedication. About 50,000 people attended and saw Army P-47, P-63 and B-29 planes perform.

The new Norfolk airport is the result of a number of years of hard work by the Norfolk airport committee, of which several CAP members are prominent workers.

Sailplanes from AAF Surplus Stocks to Go to Civil Air Patrol

Sailplanes for Civil Air Patrol units are expected to be allotted by the Army Air Forces from surplus AAF stocks, Col. Earle L. Johnson, national commander, told staff members of Lt. Col. D. Harold Byrd's Texas Wing at a luncheon in Dallas last month. The Army has several hundred surplus sailplanes of the two-seater type.

Col. Johnson reported the CAP is being swelled by 100 new adult members daily. . . . CAP Cadets now number 80,000. . . . More training aid devices are forthcoming, as are more CAP Pre-Flight Study Manuals for Cadets.

Oklahoma's Fourth CAP War Conference Slated

Oklahoma's fourth Civil Air Patrol War Conference will be held at Oklahoma City November 15 with representatives of some thirty different wings in attendance, according to Lt. Col. Moss Patterson, commanding the Oklahoma Wing.

The CAP air parley will be held in Oklahoma City in connection with the 1944 National Aviation Clinic on November 15-18. The principal speaker of the CAP conference will be Colonel Earle Johnson, the National Commander. This CAP session is expected to attract more than 250 officers and enlisted men and will deal with the various recruiting programs to obtain flying cadets and WAC's for the armed service.

Reunion Planned in Michigan for Pascagoula Coastal Patrol Veterans

Lt. Bill Napier of the Michigan Wing is planning a reunion of those who served on CAP Coastal Patrol at the Pascagoula Base (Mississippi), in December. Many are in the armed forces but it is possible that some are still in the country and an effort is being made to contact them. All who served are asked to communicate with Wing Headquarters, 2310 Book Tower, Detroit, Michigan.

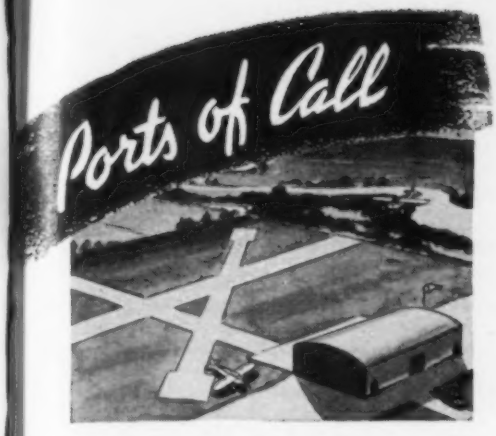
CAP Helps in Airport Projects

Members of the Rockland County, N. Y., Planning Board discussed possibility of a county airport at a postwar development meeting at New York City, recently. The discussion was led by Lt. Albert Morris, CAP's one-man army who has recruited and trained scores of cadets on his own. Preliminary surveys have been made and the board will inspect some airports to get ideas. And at Orange, Mass., the Kiwanis Club and CAP worked together on the dedication of an airport at that town last month.

CAP Dedicates Airport at Greeley, Colorado

CAP members and fliers from Cheyenne, Wyoming, Denver and Grand Junction, Colorado, helped in the dedication of a new airport at Greeley last month. Twelve CAP planes were operating, giving free rides to all war bond purchasers. Five Army bombers from Patterson Field staged a demonstration of attack and pursuit. The Lowry Field band gave a concert. The dedication of the airport as "Crozier Field" was in tribute to Capt. Clarence "Red" Crozier, an AAF flier who lost is life on his 68th bombing mission in the European theatre.

Civil Air Patrol Cadets of Squadron 4 Group 9, Michigan Wing, are shown above practicing code in a communications class conducted by Robert W. Weaver. The class maintains an average membership of thirty seniors and cadets. The communications section is equipped with one electronic keyer, one oscillator, sixteen keys and thirty-four headphone sets.



By TONY HAGMANN

Houston, Texas—*On tour with Tony* . . . Where it rains on one side of the street only, and not every day, just most. We flew down with the Don Crosbys, who said they'd rather sort wild cats than travel by car, and they wished they had their Spartan again. Hurmp. Who wouldn't? . . . Ran into some ole friends . . . Tony McKay is back . . . Jackie and J. D. Reed have taken up shop again . . . Ellis and Smitty are back workin' on them "cookin' machines" (engines), Gotch said: "We don't know anything about anything behind the fire wall, but in front, well, just ask us."

At Cunningham Airport, where Erwin-Newman do a fine business in aviation, we saw new runways in the process and some mighty nice plans in the making—more improvements.

R. D. Moore, of Kansas City, arrived by Culver, a neat number in silver with an N. C. of 984. He manufactures airport maintenance equipment and is thinking about making a portable airport, to carry along in the plane for pilots who wanna sit down when it gets dark.

We found tracks of Charlie Scholes, who'd flown to Oke City; tracks of Henry Kreigle and Earl McKaughn, and overheard that J. M. English, who used to fly such a pretty Waco, was back in the States, a Major for Uncle. And that is our two bits worth, for this month, cousin; wrap up a cut of Red Star and we'll get goin'.

Dallas, Texas— Lieut. Colonel Garza Wooten is home from the wars complete with ribbons and stars. We did not hear how he got 'em, but we could guess without getting any warts on our nose. Bill Long said: "He's rehired as of yesterday, by gad," and now you'll find the Colonel running DAS Hudson Airport. He'd been top hand at Hicks before going into active service. He brought home a grade one recipe for spaghetti. Guess he's been in China, huh?

Just to put some frosting on your cake, step into Room 200 in the Ad Bldg. at Love Field and you will see the reason why people need information about charter service or the airport. Kay Woods, who is the sec. for M.D. Darrah and Doc Watson, is the dab of honey who gets the questions. Answers? Well . . .

On the serious side of life . . . we found an airplane complete with all the fixin's in the almost center of automobile row. Simplified Flying Service has set up shop where the walkin' public can touch a "real plane". In fact they've kicked two holes in the fuselage already. Ronald Perkins, who is the owner of this new idea in aircraft sales rooms, said; "I want 'em to see how easy it is to fly." Well, they can.

There is a new CO at the Fifth Ferrying Group. Colonel A. E. Higgins has taken over the deal and we understand from various sources the Colonel wraps up a very neat Army package. He lived in Dallas from '28 until '37, flew at Love Field in a Stinson or a Stearman J5, a pair of sweet planes. Flew with Tom Hardin. From the things we've been hearing, Colonel Higgins, it's "Roger".

Lockheed's Flight Operations (boss wrangler Ben Branson, a flying man plus 8), is a very busy place. The Queen Bee is Ellen Stewart (she knows the cutest jokes) and

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the very latest dope, which he won't tell, comes from Johnny Duke. Point is, if you ask them real carefully, they might tell you where they get cigarettes. Nobody else knows.

A Fort Worth boy who made good at the Dallas War Chest Luncheon, is Lt. Paul A. Marriott. He was shot down over Germany, wounded and recovered. He said he could tell us the value of the War Prisoners' Fund; it got where the money was needed. He taught at Hicks two years before getting in his part toward licking the jerries.

Kansas City, Missouri — *by Marion Melcher* . . . Ed Smith had the misfortune of having one of his planes "land" in the muddy Missouri last month. The two pilots in the blue and yellow Howard trainer escaped from the open cockpit and were taken aboard a rescue boat. The plane and its troublesome engine were recovered and returned to the Kansas City Flying Service. . . .

Last minute news is that City Manager L. P. Cookingham has soloed, as did the Director of Public Works, K. K. King. . . . The comedian with the sliding nose, and the funny man with the mustache — Bob Hope and Jerry Colonna—air-hopped into K. C.

Poor Pfc. Tuffy! The ATC 33rd Ferrying Service at Fairfax can't keep him now that he's bitten the hand that literally feeds him (one of the pilots). The city's Swope Park zoo is too crowded for the fourteen-month-old lion cub . . . and they are trying to have Tuffy quartered at the zoo in Fort Worth if a cage is available.

The sale of surplus Government-owned planes is going well in this seven-state area. Close to 1,000 planes have been purchased by professional men, ex-service men and housewives. Closing date for receiving bids at the City Hall CAA offices is twelve o'clock noon each Friday. The service planes are sold "as is" and "where is", you know.

Kansas City plans to print its name on the Postwar Air Map. Officials are looking about for suitable sites on the outskirts of the city to take care of private fliers, flying schools and other services, which expect to be crowded off the Municipal Air Terminal soon after the war ends. The auxiliary port—Grandview—probably will accommodate freight planes and those too large for the municipal airport. Airlines may use Grandview when the Municipal port is fogged in.

The fall term of classes offered by group No. 2 of the Missouri Wing of the CAP began October 2nd. The course covers two hours of classes on Monday and Wednesday nights for a ten-week period.

The Kansas City Unit of the Women's National Aeronautical Association had Mr. Frank Buttomer, Director of Research at Mid-Continent Airlines, as speaker at the dinner meeting on October 11th. The Unit is sending a number of delegates to the National WNAA Convention in Oklahoma City, which meets in conjunction with the Aviation Clinic on November 15th to 18th. In an effort to be "sharp" when it comes to postwar activities, a questionnaire was mailed to the 130 members of the Unit so that a constructive program could be formulated. National WNAA Program Chairman, Mrs. Eunice Mecaskey, is handling the compilation of this Unit data.

Birmingham, Alabama — *From Edith Wideman.* With P-38s, B-29s, B-24s, A-26s, etc., even gliders being towed all over the place, students of aircraft identification (commonly known as Southern Airways' Sunday Hangar Flyers) have been having a field day of late . . . both sides of the field have been literally covered with all kinds and descriptions of planes. In fact, so many that Hangar Flying is now looked upon in Birmingham as a highly respected art.

CAP'er Billie Donovan says: "No broken ribs today, thank you!" as he walked away from CAP'er Mike Banton's plane in "Ye Ole corn field" north, northeast of the Birmingham Airport. As for broken ribs, say the spectators, he must mean his own and not those of Mike's plane!

Speaking of CAP—Hayden Brooks, Chairman State Aviation Commission, Major in CAP, etc., pinch-hit for Lt. Col. Harold Wood the other day when the Aero Club dedicated a program to the CAP. Many CAP'ers were there in uniform et sans uniform. After all said those sans uniform—"Who can travel across town to change clothes at noon day?" "We want not only Airparks, we want Airparks with lockers for uniforms."

Commanding Officer of the Birmingham Air Base, Colonel Warner B. Gates, gave the BH Aero Club an interesting outline of the Army installation on the Municipal Airport at a regular meeting of the membership. . . . In its postwar plans the Aero Club has under consideration ways and means of acquiring the Officers Club at the Air Base (when the Army no longer needs the use thereof) for an Aviation Club . . . Sounds "wunnerful", doesn't it?

We learn that Tom Eve was elected president of the Southeastern Region of NATA at a meeting held in Macon in connection with the Georgia Aviation Conference. Tom has recently been transferred from Greenville, S. C., to Charlotte, N. C., to manage Southern Airways newly acquired base in that largest of cities in the two Carolinas.

Out of Montgomery comes the announcement of the State Aviation Commission that legislation to promote postwar aviation growth in Alabama is now being planned. Scores of

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new airports, including several for the Birmingham district, are to be built in the development program. This is to be part of the proposed US program which will be "topping" the billion dollar figures. State Director of Aeronautics says state legislation is needed in order that Alabama may share in this program. The plan calls further for the improvement of existing airports and airfields in addition to the new fields and airparks.

WAC Captain Jean Boulware has been logging dual hours at Southern Airways and everybody is standing hopefully by waiting for the round of "pop" that she is "on the list" to buy. . . . WAC Dolorer Dormer was right in there pitching with the Captain for first solo honors when Dolorer was transferred—however, Pvt. Mary Kochan has pitched her hat in the circle and is flying a close second.

Frances Peacock, Airport Manager Steadham Acker's secretary, really knows what priority flying can do to a poor Army widder. Upon her return from a visit to Army husband she wasn't bumped once—but at every single place the plane landed—at that she made it home twenty-four hours sooner than otherwise.

Aviation was not overlooked in the Southeastern Industrial Recreation Conference held

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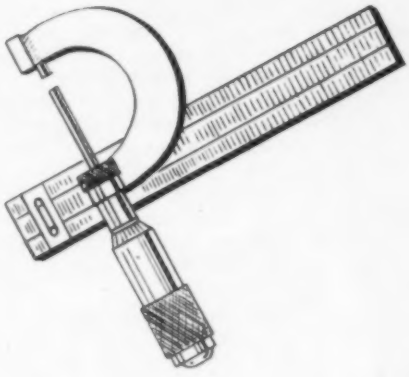

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in October. "Leadership Problems" was the subject of Lloyd C. Ripley, who hails from Wright Aeronautical Corp.

Oklahoma City—*Ruth Madden reported* Country Club Airport has been purchased by an old friend of Oke City's flying fans, Earl Henry. Earl has been over at Ponca City teaching the RAF pilots how the flying machines work, for Darr School of Aviation. Everybody here is happy to see him back, enthusiastic over flying . . . happy that Country Club is open to civilian flying again. And an invitation is extended to fly up any time and visit the field.

Stillwater, Oklahoma—The Oklahoma Flying Farmers have organized as a chapter of the NAA and are headquartered at Oklahoma A. & M. College, in this air-minded city. The first all-farmer fliers in the U. S. to have such a club, this group of pilots fly over their wheat fields, or cotton fields checking crop progress, etc.

Henry Bomhoff, Calumet, is president; Forrest Watson, Thomas, vice president; Mrs. Todd Davis, Minco, secretary; and Thomas McCurdy, Cooperton, treasurer. Directors are: H. C. Hitch, Jr., Guymon; Clyde Keller, Thomas; John T. Krittenbrink, Jefferson; C. S. Moore, Roosevelt; J. Edgar Portwood, Hobart; Ben Talley, Roosevelt; and Arvid Temple, Buffalo.

To become a member you must be a farmer or a farmer's wife, use your plane in actual conduct of farming, and live in Oklahoma. Which reminds us of the song: "Hi Ho The Merry O, A-farming We Will Go."

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